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Section of Diseases of Children.

President: Robert Hutchison, LL.D., M.D., F.R.C.P. (London).

Vice-Presidents: E. H. M. Stephen, M.D., Ch.M. (Sydney); H. Douglas Stephens, M.D., M.S., F.R.A.C.S. (Melbourne); E. H. Williams, M.B., Ch.B., M.R.C.S., L.R.C.P. (Dunedin); F. N. Le Messurier, D.S.O., B.S., M.D. (Adelaide).

Honorary Secretaries: J. G. Whitaker, M.D., M.S., F.R.C.S., F.R.A.C.S. (Melbourne), Ian J. Wood, M.D., M.R.C.P. (Melbourne).

Hare-Lip.

DR. H. D. STEPHENS (Melbourne) opened a discussion on hare-lip. He confined his remarks to the complete single cleft of the lip with accompanying cleft of the alveolus and palate as being the most severe common type. He thought that operation on the lip should be completed before the infant was four months old. If this could be satisfactorily accomplished, the pressure exercised by the musculature of the reformed lip would push back the most prominent cleft alveolus within twelve months as a rule. Dr. Stephens said that he rarely operated on a baby under the age of two months unless it was growing vigorously. If the nutrition problem was under control and the infant was gaining at least four ounces a week, the age of election was from six weeks to four months.

Dr. Stephens discussed in detail the pre-operative procedures that were necessary. The anæsthetic that he preferred was ether only, given first of all drop by drop and then by the intrapharyngeal method through a catheter introduced through the normal nostril. Of the single flap operations he preferred the medial to the lateral flap method if the thickness of the medial flap and the depth of its red border were sufficiently good to insure the fullness in the middle line that was so essential to success. Dr. Stephens briefly outlined the medial flap operation that he was in the habit of using.

SIR HENRY NEWLAND (Adelaide) said that he agreed with Dr. Stephens that the complete single hare-lip with accompanying cleft of the alveolus of the palate was the most difficult type of hare-lip for surgical repair. He had not heard of a suitable embryological explanation for this defect. He did not agree with those who advocated operation in the early days of life. In the early weeks the tissues were more difficult to handle and the consequent trauma had more serious effect, so he was in the habit of regarding the age of six weeks to three months as being the most suitable for operation. At the same time it was consistent with orthopædic experience that treatment should

commence as soon after birth as possible. It was possible, with cooperation of the nurse and of the mother, to commence correction of the hare-lip by appropriate pressure on the projecting alveolus soon after birth. The manipulations consisted in pinching up the lip and compressing it laterally during the first six weeks. He was quite in agreement with the pre-operative measures advocated by Dr. Stephens. The operation favoured by Sir Henry Newland was similar to that described by Sir William Stokes in his book on operative mechanical surgery. He preferred to cut the skin incisions before the tension was relieved by any undercutting. No tissue at all was removed in this operation. It was possible to give the deep surface an ample lining of mucous membrane and there were large surfaces to co-apt. It was important to avoid notching on the margin of the lip and linear depression extending down from the nostril. He did not use any dressings after operation. Tension was relieved by a silkworm gut suture tied over a thin rubber tube, in addition to one within the mouth. The outer suture was removed within forty-eight hours, and the others within five days whenever they affected the appearance. All surgeons who operated on hare-lip patients occasionally experienced the disaster of a breaking down of the lip after the removal of the sutures. In the operation that he advocated, no tissue was removed and reoperation was possible. It was difficult to get the *ala nasi* of one side to conform exactly to the shape of the other, with resultant buckling, which was apt to leave a trumpet-shaped nostril, but later in life the buckling tended to disappear.

Dr. P. L. Hipsley (Sydney) compared the work of plastic surgery of the lip with that of an architect, which remained exposed to the public gaze. He was in the habit of using a method similar to that described by Sir Henry Newland. Dr. Stephens disregarded the cleft in the alveolus for the most part, but the gap usually closed by the time the baby was twelve months old. The tension was great, however, and Dr. Hipsley thought that it was important to bring the outer portion of the alveolus towards the mid-line to get firmer support when the septum was attached to one side. He closed the gap with silkworm gut or wire suture in the manner of Brophy's operation. He knew that it interfered with the teeth germs, but he felt that a better lip resulted. Dr. Stephens had stressed the freeing of the lateral portion from the maxilla, but Dr. Hipsley thought that the less the median portion was interfered with, the better, on account of the danger of hæmorrhage from the septal artery. In regard to the position of the patient at operation, Dr. Hipsley liked to have the child's head hanging back, and he found that a perineorrhaphy table was very useful. He thought the most favourable time for operation on a baby weighing nine or ten pounds was when the baby was a week or two old. He was in favour of very early operation; the family was relieved and the breast milk supply was saved for the baby. It was a little more difficult to operate on these very young babies, but there was no question that they stood the operation very well. With regard to the type of operation, he thought that it was important not to remove any tissue at all. When the flap was turned back, a little prominence was left which might be useful in repairing the anterior portion of the cleft. He had abandoned all retentive apparatus.

Dr. R. Graham Brown (Brisbane) emphasized the importance of correction of the associated nasal deformities and stated that the degree of deformity of the nose and the face varied with the width of the cleft in the lip; it was necessary to correct the nasal deformity as an essential part of the operation. If this were not done, the cosmetic result was worse and there was a tendency for the deformity to increase as the child grew. The surgeon always failed relatively, as no perfect operative result had ever been obtained, but the more experienced the surgeon, the better was he able to select and adapt the method suitable in an individual case. By simple closure of the lip the patient's life would be saved, but good repair led to improved health and greater happiness throughout life. Dr. Graham Brown exhibited a number of diagrams illustrating Blair's modification of the Mirault operation and demonstrated the advantages of taking nasal deformities into account as an important part of these operations. He regarded eight weeks as the most suitable age for operation, but stated that Blair would operate in the first forty-eight hours if possible; otherwise Blair preferred the end of the second month.

Dr. Douglas Stephens, in reply, stated that he quite agreed with Sir Henry Newland that early pressure on the lip was effective. He was in the habit of using strapping on the youngest patients to maintain the pressure, and he encouraged the nurse or mother to pinch the lip together very frequently. He recognized that in the operation, which was a modification of the Stokes operation, no tissue was removed, but the filamentous strip that Dr. Stephens removed was not of any use. He disliked any intermediate catgut suture, but used the suture on the outside of the ala with a tube in the nostril to prevent the condition known as "kinky nose". Dr. Hipsley had referred to mechanical closure of the alveolus with a silver suture, but Dr. Stephens, in dealing with single hare-lip, preferred to fracture the alveolus. In reply to Dr. Graham Brown, Dr. Stephens stated that he had found Blair and Brown's method most useful in specially selected cases, but in his paper he had not dealt with secondary operations for repair of nasal complications.

Infant Feeding.

Dr. H. Boyd Graham (Melbourne) opened a discussion on infant feeding. He said that a common ground for justifying and explaining on a scientific basis the good results that were obtained by feeding babies by the various methods now in use would be found if the suitability of the feeding mixtures were judged by the percentage distribution of the total calories between the basal components. When the percentage of the total calories derived from protein lay between 13 and 18, and that derived from the fat lay between 15 and 40, it was found that this distribution was suitable for a majority of babies in Melbourne. Provided that the amount of fat present in the original milk used in the mixture lay between 2·5% and 4·5%, these conditions would be fulfilled if 70% of the total calories came from cow's milk and 30% from added sugar.

Dr. Boyd Graham suggested that a simple and rapid method of deciding the feeding formula for a baby might be based on this theory. A figure suited to the age and special circumstances of the baby under consideration might be taken to be that baby's daily caloric requirement. By dividing 70% of this figure by the caloric value per ounce of the milk, the number of ounces of milk required for the day were obtained. By dividing 30% of the figure by the caloric value per ounce of the sugar to be used, the number of ounces of sugar was calculated simply. The mixture should be made up generously with water in sufficient amount to make up the shortage in fluid requirement. When this method was adopted there was no need to be concerned any further about balance, unless the baby under consideration was in an abnormal state of health. When it was not possible to obtain accurate information as to the fat percentage in the milk, it had to be guessed. In unaltered milk the figure 4% should in such circumstances be adopted in calculations, and the figure 20 as the caloric value per ounce of the milk. Concentration of artificial feedings to a caloric value per ounce of approximately 18 calories was desirable to eliminate anxiety concerning the fluid requirement. In all circumstances the protein of the mixture should be modified. Simple dilution and simmering were frequently effective.

With more time at one's disposal and with more experience in infant feeding it was definitely preferable that more highly individualized feeding mixtures should be used. Appetite feeding with reservations and under control was to be preferred to the administration of a fixed amount at each feeding. This statement was particularly applicable to mixed feeding. In estimating the intake of breast milk, consecutive or periodical daily test feedings were much more reliable than were scattered test feedings. Early recognition of failing lactation and prompt attempt at reestablishment would prevent avoidable under-feeding. An attempt should be made in selected cases to prevent the usual initial loss of weight after birth. On account of

weaning, a baby should not lose weight. Cow's milk should be included in educational diet prior to weaning. Complementary feeding should precede supplementary feeding. The supplementary feeding should have a higher caloric value than that of the natural feeding it replaced. Frail babies should be given a "trial by food". The power of recovery after under-feeding was remarkable. There was a definite line of growth for each baby which would be followed if the baby received sufficient suitable food. Accurate weighing of the baby and careful measurement of the ingredients of the food increased the clinician's control considerably and helped him to supervise infant feeding intelligently. The principle concerning over-feeding that emerged on close observation was that, without forcing the feedings, a baby would not take too much of one constituent, except to get enough of another. This principle applied to natural feeding and to artificial feeding alike. When a baby took too much solid food to get enough fluid, fat seemed to be the first ingredient to cause trouble. It was important that the early signs of fat disturbance should be recognized and taken as a warning to remove some of the cream from the milk and to increase the intake of water. With natural feeding the same effect could be obtained by giving more water to the mother and to the baby and by temporarily reducing the length of each feeding.

Dr. E. H. Williams (Dunedin) stated that Dr. Graham had advanced a new method of calculating the nutritional requirements of babies. Dr. Williams did not think that there was much difference in principle between this method, that advocated by McKim Marriott, of St. Louis, and the method used in New Zealand, in which cow's milk was modified to resemble human milk in certain respects. He was glad to know that Dr. Graham, in his paper, had paid generous tribute to the Karitane Hospitals, and Dr. Williams felt, too, that in connexion with breast feeding the procedure at these hospitals had received general acceptation. He had read the article by Grover Powers to which Dr. Graham had referred, and also an article by Irving Fisher in the *American Journal of Physiology*, upon which, he understood, Grover Powers had based his work. Powers had referred to the humanized milk method as obsolete or restricted in its use. He (Dr. Williams) gave this statement an unqualified denial, for he had used the method for nearly thirty years and was still satisfied with it. In comparing the percentage contribution of protein to the total calories by Dr. Graham's method, the protein contributed 14%, by McKim Marriott's method protein contributed 12%, and by the so-called humanized milk method the contribution of the protein was 9%. It had been stated that one and a half ounces of cow's milk were approximately equivalent to two and a half ounces of human milk in biological value of the protein included. They should recognize that the protein consisted of parcels of amino-acids, only some of which were of real importance. The conclusions stated had been arrived at from animal feeding experiments, and it was doubtful to what extent they were applicable to babies. He would not go so far as to say that as much as one and a half ounces of cow's milk were necessary as an equivalent for two and a half ounces of human milk. It was Dr. Robert Hutchison who, in the recent edition of his famous book, had referred to the fact that the correction of the relative proportion of caseinogen and lact-albumin, though theoretically sound, was not necessary from the practical point of view in the case of a normal healthy infant. Dr. Williams was in the habit of using a higher percentage of protein, namely, lesser dilution of the milk, for an under-weight infant until it reached the expected age-weight line, and then he made the mixture more dilute. Dr. Williams stated that in New Zealand, in deciding upon the theoretical caloric requirement, they took a number of factors into account, which included the age, the weight, the expected weight, the length, hereditary characteristics and, to a smaller extent, the appetite of the baby.

Dr. F. H. Le Messurier (Adelaide) agreed with Dr. Graham that the percentage composition of a mixture was not a reliable guide to the suitability of the mixture. The protein percentage was the most contentious matter when the suitability came up for discussion. Certain amino-acids, such as lysine, cystine, tryptophane and tyrosine, were essential for growth and development and could not be synthesized in the body. Lact-albumin was the most valuable protein in milk, and cow's milk contained a lot less than human milk. While the method suggested by Dr. Graham might be applicable to healthy babies, particular attention should be paid to the difficult baby that one met in a babies' home. The essentials deemed as sufficient by Dr. Graham would apply equally to whole milk with the addition of 7·5% sugar and to a dilution of two parts of milk and one of water with the addition of 5% sugar. Such calculations made it difficult for the general practitioner to advise people readily. Dr. Le Messurier did not like the percentage of fat to exceed three if the added fat was derived from "Kariol" or cod liver oil emulsion; but if the fat were given in the form of butter, he found that babies could digest a higher percentage. He used the Czerny-Kleinschmidt butter-flour mixtures for this purpose. The fat was approximately 4·4% and the protein varied between 1·5% and 1·7%. He would like to know how people felt about the use of starch in feeding infants under the age of six months. He knew that it was common to oppose the use of starch for the young babies, but with the butter-flour mixtures he had been gratified by the progress made and had not had any difficulty with the digestion of starch even by a baby of three months. He felt that it was likely that the wonderfully low infant mortality rate in New Zealand was due to the fact that in New Zealand between 80% and 85% of babies were breast fed. He had not been able to obtain the figures for South Australia, but he did not think that they were so good as these. Possibly the low mortality in South Australia could be ascribed to the use in artificial feeding of milk in a digestible form and free from pathogenic bacteria or other harmful ingredients given in sufficient amount. He calculated that one ounce of milk was the equivalent of one gramme of protein.

Dr. Robert Southby (Melbourne) drew attention to two other factors which might be of importance in infant feeding. The first was the size of the fat globule in a given sample of milk, and the second was the type of curd.

Dr. Robert Hutchison (London) said that as the result of forty years of experience in the feeding of infants he had come to the conclusion that the subject called for inexhaustible human ingenuity. He thought that Dr. Graham's paper contained a great deal of valuable truth, but he would warn him not to be too mathematical. Surely it was not so frightfully difficult to rear normal babies. In fact, he had often wondered at the invulnerability of the average baby. It almost seemed at times that gross underfeeding, such as resulted from untreated pyloric stenosis, did the babies good. It was surprising to see what fine specimens these babies were at twelve months of age. The important thing was to avoid setting up a disorder of digestion.

Dr. Graham, in reply, expressed his appreciation of the manner in which his paper had been received and regretted that some of the speakers had found the figures complicated. It had been Dr. Graham's intention to simplify matters by pointing out that it was only necessary to fix on some figure as a theoretical caloric requirement and to divide the calories between the milk used and the added sugar in the proportion of 7 to 3. For the general practitioner, using ordinary milk for normal babies, and observing the simple principles for fluid requirement and modification of protein, this system provided a simple method. The rest of the paper had been intended to supply some of the calculations on which this method rested, and to indicate how greater accuracy could be obtained in the management of individual babies presenting special problems.

Pink Disease.

A paper by Dr. A. Jeffreys Wood (Melbourne) and Dr. Ian Wood (Melbourne) was presented as the opening contribution to a discussion on pink disease. These authors first discussed the historical aspect of the subject. They pointed out that Rocaz, of Bordeaux, had recently drawn

attention to an excellent description of pink disease by Selter, of Solingen, the Ruhr, which was published as far back as 1903. At a congress in Cassel this German physician had related his observations on a new malady, and this should undoubtedly be accepted as the first authentic description of pink disease. In the report of the congress the following statement had appeared:

> Herr Selter (Solingen) reported eight cases of an illness for which he found no analogy in literature and which he termed "trophodermatoneurosis". The malady occurred in girls of 1½ to 3½ years. It was of gradual onset, and manifested itself in loss of interest, nervousness, and progressive loss of speech. Other features were delirium in sleep, mental disturbances (hallucinations, coprophagy), and profuse sweating with its consequences (sudamina, eczema, and sodden skin). The hands and feet were swollen, reddened and cold. The patients had a constant sense of coldness and itchiness, and there was a loss of hair (mostly temporal), sometimes amounting to complete baldness. As clearly secondary phenomena, paronychia and boils appeared. The internal organs showed no abnormalities. The illness ended favourably in all cases in weeks or months.

At Auckland in 1914, Swift, of Adelaide, had independently restated the syndrome, which he called "erythrœdema". About 150 patients had been personally studied in private practice by one of the authors (A.J.W.), and these formed the basis for discussion in the conjoint contribution.

Pink disease attacked males and females in practically equal numbers and did not occur in definite epidemics. One of the features of the disease was that it occurred in young children, the majority being between nine and eighteen months of age. The cause was not known, but there were many theories, notably that of infection. In the present series 24% of the patients had had a febrile attack at the onset. The temperature had risen to 100° or 102° F. and was usually accompanied by upper respiratory infections. The infecting organism might yet prove to be a virus which was widely spread throughout the community in a non-pathogenic state.

With regard to the symptomatology, it was interesting to note that an analysis of 57 consecutive patients showed that the average time for the appearance of red, swollen hands and feet was the fifth week of the disease. It had occurred in the initial stage in only twelve of the patients under review, and in five it had not appeared until the third month. Several authentic cases had been recorded in which the pinkness had not appeared at any stage.

Pink disease showed a natural tendency to improve during the third month, and yet this improvement was constantly being claimed as being due to some new form of therapy. Treatment in the open air was of the greatest value, and, if possible, the children should sleep on open balconies. The body should be lightly clad both by day and by night. Silk or cotton next to the skin was infinitely more comfortable than wool, especially when the skin was sweating freely. In regard to local applications, a tepid bath should be given night and morning, and after careful drying with a soft sterile towel the skin of the whole body gently rubbed with methylated spirit. This should be followed by a liberal dusting with a talc or zinc and starch powder. The methylated spirit application kept the moist perspiring skin free from coccal infections. Infections of the mouth were very serious. The mouth could be kept fairly sterile by letting the child chew on a swab of cotton wool fastened in sterile gauze moistened with peroxide of hydrogen (one part to four of water). Owing to the thirst that was such a prominent feature, milk would usually be taken in fairly liberal quantities. Raw eggs might be mixed with the milk. Raw vegetables, such as lettuce, and also raw fruits of all kinds, might be given with advantage. Under ideal conditions the mortality was low, most patients being restored to perfect health. The complications that might appear during the prolonged course of this disease comprised the chief danger to life, although on rare occasions sudden death might unexpectedly occur in the absence of any obvious superadded condition. When the patients were treated in hospital wards, cross-infections, such as bronchopneumonia and gastro-enteritis, were especially liable to occur.

Dr. R. Hutchison (London) stated that pink disease was relatively less common in England than in Australia, and in the past five years there had been only thirty authentic cases. It was a most exasperating condition, and he was baffled to suggest a cause, and the treatment was unsatisfactory. It was new to him to hear the history of Selter's description of it so far back as 1903, but he had no doubt that pink disease occurred before that, although it was not recognized. Ten years later than Dr. Swift he had recognized these patients at Great Ormond Street. Curious little outbreaks or islands of the disease occurred in England, but not noticeably in London; rather in the midlands, in the neighbourhood of Birmingham, where Dr. Parsons had encountered it. The two great theories of pathogenesis were the deficiency theory and the infective theory, and he had great difficulty in accepting either of them. Professor Peters, in Oxford, was investigating certain fractions of the vitamin *B* complex, and some of these were being tried out at Great Ormond Street. Professor Peters regarded the results as suggestive, but by no means certain. Nor was the infective theory attractive; pyrexia was not constant, but one could not exclude secondary infection as a cause of rise of temperature. It had been said that the condition occurred predominatingly at that period when infections were prone to occur; but so did nutritional disorders, such as rickets. One could not rule out the possibility that it was an infection of some sort. Again, it had been thought that a virus might be the cause. This seemed to Dr. Hutchison to be too easy an explanation. There seemed to be no specific remedy or short cut to recovery, but Dr. Hutchison would be glad to hear if atropine had been tried and, if so, with what success. He had not been impressed by its use in the few cases in which he had used it, except for controlling excessive sweating.

Dr. Edgar Stephen (Sydney) found that treatment of these patients in their own homes was more satisfactory than treatment in hospital, and they were admitted to hospital only in exceptional circumstances. Of sixty-eight patients with pink disease admitted to the Royal Alexandra Hospital for Children in Sydney, 23% died. These patients had been severely ill, and much time had been lost in combating insomnia unsuccessfully and in overcoming anorexia. The prognosis was worse in such circumstances and when the sweating was excessive. At times the diagnosis was in doubt when the raw beef hands and feet were not characteristic, and in certain circumstances the X ray department had been able to help. As in scurvy, there were certain features in the appearances of the centres of ossification; in particular a certain glassy appearance had been noted. It was wise to use intranasal feeding at an early stage, to be sure that one was on the safe side. The administration of the food was difficult, but by re-feeding and persistence a good nurse could do wonders. Cross-infections had not been the cause of death in this series. Two children had died of bronchopneumonia, but sudden heart failure was almost always the cause of death. Pyelitis had been a fairly frequent complication. He had used atropine frequently, but had not derived any comfort from its administration. He had thought at one time that the excessive sweating might lead to a loss of sodium chloride, and he had used half strength normal saline solution by mouth, but not with any confidence. He had since found out that the amount of sodium chloride that would be lost if the patient sweated all day long would be too small to matter. He would like to draw attention to the use of chloretone for the insomnia.

Dr. S. F. McDonald (Brisbane) said that the condition had been recognized in Queensland since 1920, following upon the excellent description of the condition by Dr. A. Jeffreys Wood, but he thought that the condition was still often missed. The distribution was widespread in Queensland, and all nationalities appeared to be affected; he had not noted any cases occurring among aborigines, half-castes or Kanakas. The treatment used had evolved much on the same lines as had been described in the

opening paper. It was interesting to remember that in 1925 A. F. Hirst had ascribed pernicious anæmia to a streptococcal infection in the duodenum combined with the functional disturbance of the stomach, but he had not hinted at any deficiency factor then. There were two important points in favour of a neurotropic virus with special incidence on the sympathetic system in the ætiology of pink disease. These were the tendency for several cases to occur in the one family and the onset at an early age, which, as there was not any recurrence, appeared to bring about a lifelong immunity. He had treated sixteen patients by liver feeding, and some did seem to be very well with it. He was unable to dogmatize on the best treatment.

Dr. Robert Southby (Melbourne) supported Dr. McDonald's views concerning the possibility of a neurotropic virus as an ætiological factor by mentioning the close analogy with certain early cases of poliomyelitis. The lassitude, the atonicity, the sweating and the irritability and depression were common to both conditions. Further, there was a predisposition of certain families to that type of infection. He had encountered poliomyelitis in three generations of one family. He remembered one child who had pink disease in infancy and later developed poliomyelitis, and at six years of age had *herpes zoster*. On this theory he had treated a few patients with pink disease by the administration of pooled normal human serum, which he thought had been of some use in poliomyelitis. He felt that the clinical condition of these patients had improved more quickly than the average, but the series was too small to justify him in drawing any definite conclusions.

Dr. F. H. Le Messurier (Adelaide) preferred the name erythrœdema for the condition which had been entitled pink disease by the previous speakers. He felt that it was associated in some way with upper respiratory infection.

Dr. A. P. Derham (Melbourne) directed attention to the pinkness of the tympanic membranes in this condition and the confusion that arose at times in the diagnosis from middle ear disease. He had known of several instances in which unnecessary paracentesis had been performed.

Dr. F. K. Norris (Melbourne) mentioned the desirability of a frank discussion with the parents at an early date concerning the probable duration and nature of the illness. He had once seen a Chinese baby with pink disease and had encountered peripheral neuritis with double foot-drop. He used belladonna and thought it was an advantage at times, and as a routine he applied some form of colloidal silver drops to the eyes to prevent secondary infection. He thought that painting the skin with iodine and spirit was painful, and preferred a 2% solution of mercurochrome. He agreed that peroxide of hydrogen for the mouth was much better than borax and glycerine.

Dr. Lucy Gullett (Sydney) emphasized the importance of warning the mother that the child wanted rest and did not need to be amused. She thought that they should look further into the question of the association of this condition with pyelitis or some similar urinary infection.

Dame Jean Connor (Melbourne) said that as Australian doctors had been so closely associated with the description of this disease, they should make up their minds to do something to settle the causation definitely and finally. At present she was completely open-minded. She thought that the causative virus theory was very hard to prove. Perhaps the condition might be due to contact with some substance which was innocuous until the patient was exposed to light. She drew an analogy with the effect on lambs of the active principle of Saint John's wort, which, when eaten, caused erythema and urticaria. She had read of the work in England along these lines and understood that it was claimed that the condition cleared up quickly when the patient was protected entirely from light.

Dr. Ian Wood, in reply, said that it could be shown whether a virus infection was the cause by special culture methods and the results of careful histological examination. He had submitted his evidence to Dr. Greenfield in England, who said that from the histological finding there was not the slightest suspicion of virus infection. Dr. Burnet in Melbourne had tried every known method of culture for viruses and had always failed. Dr. Wood had not used atropine to any great extent. He had been depressed by the way in which in comparatively mild cases patients had gone downhill after admission to hospital and regarded it as a grave danger to have to admit them.

Intussusception.

Dr. P. L. Hipsley (Sydney) opened a discussion on intussusception. He made an analysis of 486 cases of intussusception, comprising all those which had been treated at the Royal Alexandra Hospital, Sydney, during the thirteen-year period 1921 to 1934. The mortality, which was approximately 11%, was slightly lower amongst the surgeons who had used a preliminary injection of saline solution to attempt reduction before operating. His own mortality when this procedure was adopted was approximately 6·6%. By far the greatest number of cases occurred during the age period of six to nine months. About an equal number occurred during each month of the year, thus eliminating climatic conditions as a factor of importance in causation. Recurrences had occurred in nine of one hundred cases in which this point was specially noted; the earliest recurrence was one week and the latest eighteen months after reduction. In one instance the condition had recurred six times in two years and in another three times in nine months. The average duration of the intussusceptions successfully reduced by hydrostatic pressure, and when no operation was found to be necessary, was sixteen hours; but in ten of these cases the duration was over twenty-four hours. The average duration when reduction was effected by injection, but when an operation had to be done to verify the fact, was nineteen hours. The average duration of cases which did not yield to injection was thirty-one hours. Dr. Hipsley considered that about an equal number of intussusceptions began at the *caput caeci*, at the ileo-caecal sphincter and in the lower part of the ileum. The double retrograde variety and its method of formation were discussed.

In regard to the ætiology, anatomical, physiological and pathological factors were each considered by Dr. Hipsley to play some part in causation. Heredity was also regarded as a factor in that an exceptionally long mesocolon might possibly be an inherited abnormality. Dr. Hipsley mentioned a family in which two children, and another in which the father and son had been affected by intussusception. He described the symptoms of the most common variety, and also a number of cases with atypical symptoms, such as those in which no blood was present in the rectal discharge. In one instance death had occurred rapidly from shock. In the subacute variety an intussusception might remain undiagnosed for several weeks. Dr. Hipsley also mentioned cases in which spontaneous reduction and recurrence alternated over a period of several weeks. He commented on the absence of abdominal distension for a considerable time after the onset, and said that it was this fact which was regarded as being of the greatest help in the diagnosis of reduction after the use of hydrostatic pressure; it was distension of the abdomen by the passage of some of the saline injection through the ileo-caecal sphincter which was aimed at.

Apart from the immediate dangers of open operation, the fact that there were remote dangers was emphasized by reference to cases in which intestinal obstruction had occurred several years after operation as a result of small bowel having become adherent to the deep surface of a mid-line incision. When small bowel had become adherent to an abdominal wound in a child, intestinal obstruction was regarded as being very likely to follow years later because of the unequal growth of the bowel above and below the adherent portion. In regard to the immediate risks, Dr. Hipsley noted that among the 486 patients treated, death occurred in all cases in which resection had been attempted, in all cases in which a complete laceration of the bowel had occurred during attempted reduction, and in several cases in which the operation had presented no difficulty and when reduction had been effected with ease. Death in the last-mentioned group had been due either to intestinal obstruction or to general peritonitis.

Dr. Hipsley described the method of reduction by the use of hydrostatic pressure. He said that the pressure

of a column of water not more than three feet six inches high was used and was obtained by suspending a douche can at this height above the child. No lubricant was used on the catheter which was inserted into the rectum. Over 60% of intussusceptions were invariably reduced by this method, and in 40% the diagnosis of complete reduction was made. In about 20% of reduced cases reduction had to be verified by making a small incision. When reduction occurred, some of the saline solution passed through the ileo-caecal sphincter and produced a uniform distension of the abdomen, which was obvious on inspection or could be demonstrated by measurement of the circumference before and after treatment. A teaspoonful of powdered charcoal was sometimes left in the stomach, and when reduction had occurred this could be recovered by washing out the large bowel four or five hours later. A thin opaque enema was sometimes used instead of saline solution, and X ray examination was used for diagnosis of reduction; but Dr. Hipsley did not recommend this method because valuable time was wasted and it had no advantages over the demonstration of the distended abdomen. He advised operative treatment in a number of cases, such as in all long-standing intussusceptions after a preliminary short attempt by injection, in recurrent cases, in subacute and chronic cases, and when one could feel thickened bowel or an unreduced part of intussusception after attempting reduction by hydrostatic pressure. An attempt at reduction by injection was made only after the operating theatre, the surgeon and the patient were prepared for an open operation. Dr. Hipsley discussed several methods of treatment that might be used when reduction after an operation was found to be impossible.

DR. W. VICKERS (Sydney) said that Dr. Hipsley's was the lowest death rate ever recorded, and Dr. Hipsley's contribution was the greatest since the work of Clubbe. He wished to emphasize the value of hydrostatic pressure as a universal measure in the treatment of intussusception. Some had been worried by the appearance of the patients at times when hydrostatic reduction was being persisted in with a view to the harmful effect on the outlook should subsequent operation be necessary. The objection that this method could cause perforation of the bowel was purely theoretical, for only one perforation had occurred in a series of over three hundred patients. He recalled one occasion on which, after obtaining the passage of fæces and flatus, it had been found that a tight intussusception was still present. At times perhaps, by persisting over long with this method, subsequent operation had been found to be impossible on account of the condition of the patient. The other objection which had been advanced had been the extra length of anæsthesia which was necessary. He had mentioned these criticisms of the method, but there were compensating advantages. When reduction was effected operation was often unnecessary. In any case, the procedure lessened the amount of intraabdominal manipulation that would be required. The use of hydrostatic pressure should be the method of choice in large centres and for early cases.

DR. H. C. COLVILLE (Melbourne) said that the unvarying clinical story was a challenge to find the cause of intussusception. Most of the patients were between six and nine months old and were as a rule healthy breast-fed babies. The intussusception started in the area of lymphoid tissue and Peyer's patches, and some of this tissue was always inflamed, and an associated lymphadenitis was always found. There was evidence of spasmodic contraction of the circular muscle fibres as well. The association of these two factors reminded one of the incisura which could be demonstrated radiographically in peptic ulcer cases. Dr. Colville also wondered why the Peyer's patches should become inflamed. The fact that so many of the babies were being fed at the time on the breast milk of late lactation suggested that investigation might reveal the presence of some irritating content. He was not convinced that hydrostatic pressure should be adopted as a routine; in the fatal cases death occurred because of the pathological processes present and not as a result of the operation. With the application of warmth and the assistance of a competent anæsthetist the results of laparotomy were very good. It was true that adhesions to the wound sometimes caused obstruction later, but he always advocated the advisability of careful and close apposition of the peritoneal edges before closing the abdomen.

DR. H. DOUGLAS STEPHENS (Melbourne) said that he had not been impressed years ago with the value of the hydrostatic pressure method, and he had not been able to diagnose by manipulation under anæsthesia whether reduction had been completely effected. Dr. Hipsley's paper and his remarks and the low mortality rate of 6·6% were important to Melbourne practitioners. Dr. Stephens said that he had satisfied himself that the apex of the intussusception was often in the *caput caeci*. The ileo-caecal variety was comparatively easy to reduce; by slipping the fingers down into the pelvis in advance of the intussusception, one found that it would run round quicker than the fingers could move round the bowel. The variety that was most difficult to reduce was the equally common ileo-colic complex intussusception. He would like to know from Dr. Hipsley the relative occurrence of these varieties in his series.

DR. S. F. MCDONALD (Brisbane) wondered whether intussusception was becoming less common; in his experience there seemed very much less than in years past. He asked what anæsthetics were being used.

DR. R. M. DOWNES (Melbourne) described his experience with irreducible or gangrenous cases when it was decided that resection was necessary. He passed two or three silkworm gut sutures through the abdominal wall and brought the portion to be resected outside the closed abdomen and operated on it there. With this procedure considerable improvement occurred in the condition of a child who was worrying the anæsthetist. In the next year he had performed extraabdominal anastomosis for three patients with intussusception and all the patients had recovered. They were genuine cases in which resection was absolutely necessary.

DR. C. PYBUS (England) had always regarded intussusception as an accident, but he thought that there might be some predisposition to œdema leading to the formation of an œdematous patch in the bowel wall which formed the seat of an intussusception. He remembered the circumstances in the family of one doctor. The mother was subject to angio-neurotic œdema, and some ten years ago one of her children had intussusception. Since then another child at the age of two years had intussusception, which was reduced very easily. He wondered whether the hydrostatic reduction could be carried out more gradually by gentler methods than had been described by Dr. Hipsley. If the baby were held upside down on a Bryant frame and the reduction were gradual, it seemed possible to do without the anæsthetic.

DR. ROBERT SOUTHBY (Melbourne) referred to the occasional unfortunate occurrence of the breaking down of the abdominal wound, and suggested the use of a split bicycle tube or adhesive strapping, completely encircling the body, for the prevention of this disaster.

DR. R. HUTCHISON (London) mentioned the possibility that physicians could reduce intussusception themselves instead of referring the patients to the surgeon.

Dr. Hipsley, in reply, stated that the position in which the baby was held did not affect the pressure required for reduction, and that, as the dorsal position was more comfortable, there was no need to hold the baby upside down or to use a frame. He always preferred ether anæsthesia, but had no objection to local or spinal anæsthesia. Manipulation of the abdomen by itself was not sufficient to effect reduction as a rule. The manner in which the abdomen became distended by the water introduced enabled him usually to be quite sure that reduction was complete. The percentage figures for the different varieties were not of much use, because it was impossible to include those cases which were reduced without operation; he thought that the ileo-colic, *caput caeci* and ileo-caecal valve varieties were about equally distributed. The occurrence of intussusception seemed to him to be rarer nowadays, but as he was now on the senior staff, and many of the operations were done by the junior surgeons, and as no figures were available, he was not in a position to make a definite statement.

Section of Neurology and Psychological Medicine.

President: Professor Edwin Bramwell, M.D., P.R.C.P., F.R.C.P. (Edinburgh).

Vice-Presidents: A. W. Campbell, M.D. (Sydney); Professor J. P. Lowson, M.D. (Brisbane); Professor F. Wood Jones, F.R.S., D.Sc., M.B., B.S., F.R.C.S., L.R.C.P. (Melbourne); Professor W. S. Dawson, B.Ch., M.D., M.R.C.P. (Sydney).

Honorary Secretaries: L. B. Cox, M.D., M.R.C.P. (Melbourne); H. F. Maudsley, M.C., M.D., M.R.C.P., D.P.M. (Melbourne); J. K. Slater, M.B., F.R.C.P. (Edinburgh).

Brain Tumours.

PROFESSOR EDWIN BRAMWELL (Edinburgh) opened a discussion on intracranial tumour, contrasting the diagnosis, prognosis and treatment of fifty years ago with that of today. He pointed out that it was fifty years since the first brain tumour was surgically removed and that the present occasion was appropriate for a review of the steps marking additions to knowledge of intracranial tumours. The earlier writers had dismissed the subject in a few sentences only, but the introduction of the ophthalmoscope by von Helmholtz in 1851, the work of von Graefe on optic neuritis, and that of Broca on cerebral localization were notable diagnostic advances. A new era had dawned when Fritsch and Hitzig, and later Ferrier, convinced the world by their experimental observations that particular functions are represented in particular areas of the cortex. Professor Bramwell observed, however, that Hughlings Jackson had several years prior to this expressed views on cerebral localization that were far in advance of the existing state of knowledge. From this time onwards great diagnostic strides had been made until Rickman Godlee successfully removed a cerebral tumour for the first time, though credit was really due to Hughes Bennett, who, probably urged by the knowledge that his own father had suffered from a cerebral tumour, made an accurate diagnosis and persuaded the surgeon to operate. In 1888 Byrom Bramwell laid down as the conditions important for successful operation that the tumour should be satisfactorily localized, that it should be accessible, and that it should be single and of such character as to permit its complete enucleation. Two years later Horsley had advocated the operation of palliative decompression, and his observations on the regression of "optic neuritis" after this procedure shed new light on this lesion, which was from this time more appropriately termed "papilloedema".

Professor Bramwell then referred to the disappointing nature of the surgical results of that time in cases of intracranial tumour, described by David Ferrier in 1898 as "a melancholy chapter in therapeutics". Ferrier had considered that 7% only of cases could be successfully dealt with; Oppenheimer thought only 3% or 4%; but all had agreed that the operative outlook in subtentorial tumours was particularly unfavourable. When Professor Bramwell was a house physician at the National Hospital thirty-five years ago, the diagnosis of intracranial tumours had reached a high standard of excellence, but the surgical side of the picture was still a gruesome one. Operation was only undertaken late, when pressure signs were intense, and *hernia cerebri* was common, being frequently accompanied by sloughing of the brain due to compression of the arteries by the edges of the trephine opening.

It was, however, in the first decade of the present century that there was a remarkable expansion of the neurological horizon. The work of Sherrington and Leyton, of the Vogts, of Brodman, and of A. W. Campbell all added to knowledge of cerebral function and cytology, and the neurologist had begun to think more in physiological than in strictly anatomical terms. Professor Bramwell referred particularly to the papers of James Collier and of Gordon Holmes and Grainger Stewart, which, with the work of Harvey Cushing on the pituitary gland and acoustic tumours, had widened the field. Cushing had recorded his surgical results in 1910, and his analysis of 64 cases of brain tumour operated on in ten months had given a fresh impetus to this work, for over half the patients were almost completely relieved of their symptoms. Cushing had pointed out the dangers of withdrawal of cerebro-spinal fluid in cases of tumour of the posterior fossa, and had advocated a wide lateral decompression so that the dura could be opened early below the cerebellum. It was now that the importance of early operation was recognized, to avoid the risks attendant on a high intracranial pressure.

Since the War there had been notable advances in various directions, particularly with regard to the histological classification of intracranial tumours by Bailey and others, the diagnostic developments of radiology and the refinements of surgical technique. Changes in the bones of the skull could be recognized by radiological methods, but even more helpful in certain cases was the procedure of ventriculography introduced by Dandy, who, in 1920, had first used the injection of air into the ventricles for diagnostic purposes. To this was added the method of air encephalography, and recently the arterial encephalography of Moniz. Such special methods had allowed an accurate localization to be made of tumours such as those of the third ventricle. Professor Bramwell quoted some of the figures of Cushing, given by him at the International Neurological Congress at Berne in 1931, showing the remarkable advance made in the surgery of brain tumours. A special debt of gratitude was owing to Cushing, the pioneer of brain surgery, who attributed the better results of today to the following factors in chronological order: correct methods of decompression, irreproachable wound healing, separate closure of the galea by silk sutures, local anæsthesia, precise localization, the use of modern suction apparatus, exact hæmostasis and electro-surgical methods. To these should be added after-care, which must be in the hands of a highly trained nurse with special knowledge of this work.

In conclusion, Professor Bramwell said that while the surgery of the encapsuled and extracerebral growths was satisfactory, the same could not be said of the infiltrating tumours. Deep X ray therapy had a beneficial effect on some forms of tumour, but it was a dangerous procedure and was still in the experimental stage. What was called for was some form of treatment which would inhibit the reproduction of neoplastic tissue and yet leave unscathed the functional elements of the nervous system.

PROFESSOR K. HERMAN BOUMAN (Amsterdam) dealt with the subject of brain tumour and mental disorder. He said that since the clinical diagnosis of brain tumour was first made it had become obvious that mental disturbances would be found in many cases, and it had been formerly supposed that special mental disorders were connected with distinct areas in the nervous system. The general opinion was that this conception was not correct. Although many complicated symptoms of nervous disorder were to be found in certain cases of brain tumour situated in the frontal lobe, temporal lobe or callosum, the finding of such symptoms was far from being a general rule. If the tumour was situated in the foremost part, apraxia was found; if in the middle part, dyspraxia; and if in the posterior part, hemianopia, in addition to the intense dementia. Professor Bouman said that in tumours of the frontal lobe peculiar phenomena had been noted—a mixture of infantile, boorish and good-natured behaviour. However, this was by no means typical or constant. Tumours of the diencephalon produced well known motor disturbances

and alteration of all the processes of metabolism. Tumours in the three situations mentioned were the only brain tumours that produced mental symptoms characteristic of their site.

Sir James Purves-Stewart (London) dealt with the diagnosis of brain tumour by encephalography and ventriculography when air or opaque substances were used. He showed a series of encephalograms and said that pneumograms might be prepared either by injecting 150 cubic centimetres of air or by the more recent method of fractional encephalography. In the latter method only three to five cubic centimetres were injected, sufficient information being obtained thereby and the possible ill effect of larger injections being obviated. Large injections might produce meningeal reaction or bring about cerebral œdema endangering life; in suspected subtentorial lesions the practice was entirely contraindicated. Injection of opaque substances, such as lipiodol or thorotrast, had been used. Definite indications must be present before encephalography or ventriculography was used. They were important accessory methods, but were only supplementary to a complete neurological examination. They were more useful in excluding than in localizing brain tumour.

Dr. A. W. Campbell (Sydney) said that, great as had been the accumulation of assets since the time of Rickman Godlee, they had been far from empty-handed at that time. Dr. Campbell referred to Byrom Bramwell, Bastian, Buzzard, Jackson and Gowers, and said that most living neurologists might hesitate to enter the lists against any of these in unaided bedside diagnosis or localization. In reference to brain tumours affecting children, he pointed out that while much more had been learned of their pathology, the child had not gained proportionately with the adult from improved surgery. The reason was that the majority of tumours in children were subtentorial, diffuse and rapid in growth, and appeared in situations which rendered them inoperable.

Dr. H. M. Traquair (Edinburgh) discussed brain tumour from the oculist's point of view. He said that great advances had been made in the last fifty years in the recognition and interpretation of "optic neuritis" or papilloedema. He considered that unilateral papilloedema was of no localizing value, nor was any measurement of the height of the disk on each side. The examination of the fields of vision occupied a very important place in diagnosis of brain tumour. However, the older methods were of no value. Small test objects should be used at a distance of up to 300 millimetres at least. Extraneous stimuli, such as noise and light, should be avoided as far as possible. The oculist played an important part in determining at what stage cerebral decompression should be undertaken to preserve sight.

Dr. J. K. Slater (Edinburgh) dealt with the pathology and classification of brain tumour. He said that the present day conception of neuroglia was a combination of two schools of thought—the Spanish, led by Cajal and Hortega, and the English, led by Bailey, Cushing and Penfield. Dr. Slater traced the development of the embryonal nervous cell from its early stage to the most highly differentiated type. There were three types of neuroglial cell—the astrocyte (which might be fibrous or protoplasmic) and the oligodendroglia. Neoplasms might arise from either of these types at any stage in their differentiation from the primitive cell. The tendency nowadays was towards a less unwieldy classification of brain tumours. The modified classification included eight types: neuroepithelioma, *spongioblastoma multiforme*, astrocytoma, ependymoma, medulloblastoma, astroblastoma, oligodendroglioma, unipolar-spongioblastoma. The development of the nervous cell was a continuous process. For instance, there was no real difference between the astroblast and the astrocyte, so that it was necessary to search a brain tumour to discover the particular stage of differentiation which its predominant cells had reached. Apart from diagnosis, such a consideration would necessarily give valuable information regarding prognosis and the value of X ray therapy.

Dr. L. B. Cox (Melbourne) discussed the question of operability of brain tumours. He made an analysis of 200 cases, 197 of which had been examined microscopically. He found it convenient to divide brain tumours into those favourable and those unfavourable. Favourability depended on the situation, size and nature of the tumour. If a tumour was to be regarded as a favourable one, it should be possible to remove it, partially or entirely, with relief of symptoms and without extensive damage to nervous tissue. Relief should be obtained for a period of not less than one year. This was admittedly a modest definition, but was employed for the purposes of this paper. He divided his cases into tumours above and below the tentorium. Of the former, 50 among 133 had been favourable. A large group comprised the spongioblastomata, which rapidly recurred after removal. The carcinoma group (11% to 13%) seemed large in comparison with American figures. Of the more favourable types, Dr. Cox mentioned the fibroblastomata, which, however, frequently recurred in two and a half years to three years. Many of the cerebral astrocytomata were inaccessible. Only 37% of these tumours were favourable. If from this the pituitary adenomata were excluded, it was found that three out of ten supratentorial growths were removable. Dr. Cox discussed subtentorial tumours from the same point of view. Of this group, fortunately, over 50% were favourable as contrasted with the supratentorial group, the cerebellar astrocytoma being among the most favourable of all brain tumours.

Dr. J. F. MacKeddie (Melbourne) said that it was surprising how relatively tolerant the brain was to trauma. He considered that encephalography was perfectly safe in the normal brain, but emphasized the possible danger in a brain that was the site of a tumour, and, of course, in subtentorial lesions.

Dr. H. C. Trumble (Melbourne) said that the cerebral surgeon must possess certain qualities to be able to carry on the work. These included physical and mental stamina and that particular mental outlook which was prepared to accept a great deal of work with a very limited chance of success. The control of hæmorrhage was still an important factor in the technique. He found that the use of living muscle was by far the most effective means of stopping a "vicious" bleeding. The question of anæsthesia was important, as were methods directed towards the conservation of blood volume during operation.

Dr. E. Graeme Robertson (Melbourne) described the method and use of angiography in localization of cerebral tumours and aneurysms. He said that ten to sixteen cubic centimetres of thorotrast were used and short exposures were quickly made. The method appeared to be free from risk.

Psychoses of Adolescence.

Professor W. S. Dawson (Sydney) opened a discussion on the psychoses of adolescence. He said that during the period of adolescence there occurred profound changes in the physical organism, involving the endocrine system, and also psychological adjustments to new responsibilities, taking the form of the transition from egotism to altruism. This period of transition was often accompanied by instability which might amount to severe mental abnormality. Hence it was found that the incidence of psychoses rose sharply from the age of fifteen onwards. The major mental disorders met at this period included the confusional psychoses and juvenile general paralyses, and mental disturbances associated with epilepsy and epidemic encephalitis or its sequelæ. These organic conditions actually formed only a small proportion of the psychoses occurring at this period. On the other hand during adolescence there occurred the first manifestations of two clinical syndromes regarded as functional in the absence of any definite pathological changes, namely, the manic-depressive psychoses and *dementia præcox*. During the acute stage of epidemic encephalitis delirium was common, and amongst the sequelæ might be reduction in mental efficiency, but true insanity was rare. Nevertheless difficulty might sometimes be experienced in differentiating melancholia, the katatonic variety of *dementia præcox* and Parkinsonism. A pronounced slowing of thought and movement with but slight depression should

not invite the more optimistic diagnosis of melancholia without a careful examination for signs of prepyramidal disorder. A moderate degree of general rigidity in an adolescent, together with the loss of interest which accompanied the sluggish mentality of the Parkinsonian syndrome, might be mistaken for katatonia.

The subject of *dementia præcox* was one about which there was still keen controversy. The study of the personality before development of the psychosis had been engaging more attention, both from a diagnostic and an ætiological point of view. Many patients displayed a fundamental lack of adaptability and from early years had seemed incapable of competing on equal terms with their fellows. The history of a personality which was inadequate in the emotional rather than in the purely intellectual field was sufficiently common to be significant. It was not difficult to understand how sensitive and self-centred individuals suffered a failure of character development from the avoidence of social contacts and the accompanying competition and struggles for self-expression, which should comprise the essence of normal activity. Unhealthy ruminations and phantasy formation might be the precursors of the delusions which later became outstanding in the psychoses. From a preventive point of view, it would appear that the recognition of these types in early childhood and the correction of anomalies in character were of supreme importance.

Manic-depressive psychoses also presented a constitutional background. There was an urgent need for more continuity of trained observation of the "nervous" child up to maturity, so as to ascertain how far the early manifestations of instability were actually precursors of insanity. While there was great difficulty in placing many cases into one or other group of the insanities of adolescence, the occurrence of a sustained exaggeration of affect in the direction of depression or elation with consistent ideation and conduct was strongly in favour of the manic-depressive syndrome with a good prognosis for the attack, although there might be a recurrence after a varying interval. It must, however, be admitted that there were many patients with adolescent instability with curious delusions and hallucinations and other features suggestive of schizophrenia, who not only recovered from their attacks but appeared to maintain a satisfactory adaptation for many years.

With regard to the pathology of these conditions there was no agreement. Various changes had been described by different workers, such as destruction of cells in the deeper layers of the cortex with gliosis. Mott's interpretation of these and other findings as evidence of deficient oxidation had led him to investigate the endocrine system. Mott's findings had not been generally accepted. The manic-depressive and schizophrenic psychoses could hardly be considered fatal in themselves, although associated disorder of conduct invited respiratory and other infections and life might be endangered through exhaustion. There was a difference of opinion as to how far pathological changes might be due to intercurrent infection, and the pathologist rarely had an opportunity of examining a case of death through violence in which these complications could be excluded. Investigation of biochemical reactions indicated a general depression of function. It was open to question how far these abnormal biochemical reactions were constitutional anomalies, specific to these psychoses, due to infection or merely the sequel rather than the cause of the inactivity displayed by so many of these cases.

Correction and treatment of physical abnormalities could not yet be said to be productive of any striking results. Beyond attention to general health, the judicious prescription of occupation and recreation was of undoubted value, and the maintenance of psychological contact between physician and patient was another important aspect of treatment. Especially in early cases of *dementia præcox*, institutional care should not be sought unless the home environment was clearly unsuitable. It was most desirable to keep these patients socialized as long as possible, provided their conduct was not grossly disordered. Finally, the recognition and correction of anomalies of character and temperament during the school years and the special observation of children of psychotic parents should be attempted as a means of preventing definite mental breakdown.

Professor K. H. Bouman (Amsterdam) described, with the aid of lantern slides, researches conducted by himself and others over a number of years into the *post mortem* appearances in the brains of patients who had suffered from schizophrenia. Microscopic examination revealed definite loss of cellular structures in various layers of the cerebral cortex. Moreover, the areas of the cortex so affected showed a definite distribution. It must be concluded from these observations, correlated with those of Mott and others on degeneration in the endocrine glands in schizophrenics, that *dementia præcox* had a physical basis. Nevertheless he considered that there was justification also for the psychological approach to the problem, and that both physical and mental aspects had a common meeting ground in the question of treatment.

Dr. A. W. Campbell (Sydney) raised the question as to whether there was any difference between the insanities of adolescence in Australia and in England, particularly in over-populated areas, such as Yorkshire and Lancashire, where he had once worked. The contrast between these places and the freedom in open spaces of Australia suggested the possible reason for the opinion he held, that there was a difference. In his long experience as a consultant he had been led to believe that so-called nervous breakdown which conformed mainly to the manic-depressive type was in many cases relatively slight, both in severity and duration, compared with similar cases in England. He asked whether personality traits observed in children could enable one to foretell the onset of *dementia præcox*. His experience at the Royal Alexandra Hospital for Children, Sydney, had not enabled him to say that he could. He realized that the wards of children's hospitals were not the right place for obtaining the necessary data, nor could one rely on the memory of parents. The desire of a child to escape from the paternal presence was no indication of a psychosis. He thought that the question of treatment was a very difficult one, and he was glad to hear Professor Dawson say that in many cases there was a definite hope of successful treatment.

Dr. C. Farran-Ridge (Melbourne) dealt with the problem of the prevention of *dementia præcox* by other than eugenic measures. As the causes which really engendered it were unknown, efforts to prevent its development in predisposed persons had to be directed towards maintaining their bodily health at a maximum and providing for them shelter, guidance and habit training. Good bodily health was of paramount importance, since time and again one met with young persons who, one felt, might have avoided a breakdown if their bodily health had not become impaired. Predisposed children should be sent to a day school rather than a boarding school, to insure their obtaining those prime essentials, good food, undisturbed rest at night, and help and guidance when they needed it. Their natural timidity and lack of self-confidence should be combated by having them taught boxing and ju-jitsu, elocution and public speaking. They were apt to take unreasonable dislikes to certain persons, and were liable to be seriously damaged mentally by bullies and psychopathic personalities among their school fellows, and by unsympathetic, sarcastic and non-understanding school masters. For these reasons it might sometimes prove necessary to remove them from school. It was undesirable that potential precocious dements should become morbidly interested in religion, and formal religious instruction should play a subordinate part in their education. The truth of the proverb that God helped those who helped themselves should be impressed on them, for they were only too apt to make prayer a substitute for effort. If it were observed that a young person's mind was being seriously disturbed by religious questionings, an endeavour should be made to suppress religious practices as completely as possible. They should be helped in every way in dealing with the problems of sex. They were so likely to acquire the habit of masturbation that early and definite prophylactic instruction should be given to them about it. Chastity should be preached to them, if only for the reason that they were not of the stuff that libertines and sexual

adventurers were made of. An effort should be made to inculcate into them sane and healthy ideas on the subject of sex. Sloppy and romantic ideas should be discouraged and they should be taught as much worldly wisdom as possible. A wise choice of occupation was of great importance. In general, it could be said that the more regular and routine their work was, provided always that it was congenial, the more suitable it would be for them. They should be trained from an early age to face facts and should be discouraged from morbid day-dreaming. Potential precocious dements tended to shrink from responsibilities, to decline opportunities, to evade social duties, and to avoid making decisions. Before criticizing them, it had to be remembered that *dementia præcox* was based on a real organic inferiority, and that the fact that its victims were incapable of effort and were unable to decide was the very essence of their malady. They could be trained only to a limited extent. When the predisposition was strong, no environment, however favourable, no training, however well directed, would suffice to avert the development of *dementia præcox*.

DR. J. K. ADEY (Melbourne) confined his remarks to early cases of *dementia præcox*, particularly as regards the prognosis. Kraepelin and others had admitted that some patients with *dementia præcox* recovered. Professor Robertson, of Edinburgh, had drawn attention to the possibility that these cases were due to exhaustive conditions rather than to *dementia præcox*. Dr. Adey had observed in a large number of these cases the frequency with which the patients showed cyanotic hands and cold extremities, even in warm weather. Attention had also been drawn to small hearts and a small lumen to the aorta found in many cases. All patients dying in the public mental hospitals were subjected to *post mortem* examination, and he had found that 40% of the cases of *dementia præcox* showed these conditions. In his opinion, one could correlate the small hearts and the cyanotic hands and separate this 40% as being of a definite type. Among a series of 45 patients whom he had sent for radiological examination, 12 were reported to have small hearts and aortas. There were no recoveries in the 12 cases. There were six recoveries in the remainder.

DR. J. F. WILLIAMS (Melbourne) said that when he started work at the Children's Hospital (Melbourne) psychiatric clinic he had hoped that he would be able to anticipate future cases of *dementia præcox* by observing abnormal personality traits, but his hopes had not been fulfilled. In connexion with the clinic they had a nursery school for children up to six years of age. Many of these children suggested pre-psychotic states. Under the influence of nursery school conditions, in which interference by adults was limited to the minimum, personality defects had become quickly modified, even those children showing negativism and other behaviour abnormalities in greater degree than was shown in a normal range and who were probably pre-psychotic, had recovered. Nursery schools were very important for the management of difficult children.

PROFESSOR J. P. LOWSON (Brisbane) said that he was interested chiefly in psychological methods of treatment, such as psychoanalysis. Most of the patients with *dementia præcox* whom he had seen had been too inaccessible, but he had reached certain conclusions from his experience with psychosis in general which doubtless would be applicable to *dementia præcox*. First, these patients were not nearly so unmodifiable by psychological means as was formerly believed. Secondly, it was necessary to persevere with these cases, in spite of repeated discouragement, as it was hopeless to expect any result in a short time. He was interested in the remarks of Dr. Williams, indicating as they did the part played by environment in early childhood. It was quite possible that if some patients had had the advantage of a nursery school they might have escaped subsequent breakdown.

DR. H. F. MAUDSLEY (Melbourne) approached the subject from the clinical standpoint. He drew attention to the fact that adolescents frequently passed through a stage with symptoms very similar to those of *dementia præcox*, but recovered and led normally useful lives. On the other hand, there was a type of *dementia præcox*, as Professor Bouman had shown, with an acute onset and deterioration of neurones, which was a somewhat different disorder. He suggested the following classification as a basis for the clinical approach to these cases: (i) the acute pernicious type with no early personality traits, (ii) the subacute type with remissions and exacerbations, (iii) a temporary psychosis with clinical symptoms of *dementia præcox* and recovery.

Malarial Therapy and the Serological Reactions of Neuro-Syphilis.

DR. C. FARRAN-RIDGE (Melbourne) read a paper written by Dr. C. P. D. Brothers, Dr. Sara Gunderson and himself on the influence of malarial therapy on the serological reactions in cases of neuro-syphilis, with special reference to the Vernes test.

Dr. Farran-Ridge pointed out that the principles upon which the Vernes test was based and the way in which it could be used as a guide in treatment had been described by Professor H. A. Woodruff in a paper published in THE MEDICAL JOURNAL OF AUSTRALIA of February 28, 1931. The outstanding point in favour of the Vernes test was that it replaced the vague notation of *plus* or *minus* signs with a numerical notation which varied little, if at all, in the hands of different workers.

Dr. Farran-Ridge explained that it had been their practice to take for examination specimens of blood and cerebro-spinal fluid immediately before inoculating the patient with malaria, at the conclusion of the malarial treatment, and at intervals subsequently for an indefinite period. They believed that malaria was a vital factor in treatment, but in deference to the general opinion that better clinical results were obtained when malarial treatment was followed by the administration of tryparsamide, they had nearly used the latter drug as an adjuvant. Dr. Farran-Ridge showed graphs illustrating the results of treatment. He emphasized the importance of the early diagnosis of neuro-syphilis from the point of view of the patient and from that of the general public. He suggested that persons upon whose health the lives of others habitually depended (railway signalmen, engine drivers, aeroplane pilots and so forth) should be medically examined at regular intervals with the possibility of neuro-syphilis in the examiner's mind.

In one type of chart shown by him the Vernes curve fell more or less rapidly to normal; in the other it remained raised for two years or longer. All the high, long-sustained curves had belonged to patients who were undoubtedly suffering from general paralysis of the insane. In every patient whose condition could unhesitatingly be ascribed to meningo-vascular syphilis, the curve had fallen rapidly to normal. Other patients who seemed on clinical grounds to be certainly general paralytics, had given curves which showed a rapid decline to zero. Possibly these patients were suffering from syphilitic pseudo-paresis. A high, long-sustained curve did not appear to have any unfavourable significance. Some patients with this type of curve had left hospital and had taken up their ordinary work again—their curves had come down to normal spontaneously. Dr. Farran-Ridge and his co-authors had come to the conclusion that the cell count was the most valuable of all tests performed on the cerebro-spinal fluid and was the best guide to treatment. The fall in cell count following malarial treatment was often very abrupt and striking. Sudden rises in the cell count were often associated with the occurrence of seizures. The results of the Vernes and Wassermann tests did not always run parallel, the result of the Vernes test usually becoming negative long before the Wassermann test, both in the serum and cerebro-spinal fluid. This fact might be explained by a difference in the sensitivity of the two tests or by the existence of antibodies to which each test reacted specifically. Several clinical histories were included in the paper.

PROFESSOR K. H. BOUMAN (Amsterdam) said that since 1921 he had treated over 700 cases of *dementia paralytica* with malaria with very satisfactory results. It was not

sufficient to give malaria only, but to follow it up with anti-luetic treatment, such as "Neosalvarsan". Patients so treated showed definitely better results than those in a series treated solely with malaria. In Amsterdam they originally gave intramuscular injections of blood from patient to patient, but now had a system of mosquito inoculation which was much better.

DR. J. BENTLEY (Perth, Western Australia) said that in Western Australia interesting work had been done, which was mentioned at the last Australasian Medical Congress, on the manner in which malaria acted in general paralysis of the insane and other syphilitic manifestations. They noticed that if malaria was given to returned soldiers who had had typhoid inoculations and who did not react to the Widal test, the result of the Widal test became strongly positive. The inference was that if there were any antibodies in the blood, these were intensified by malarial infection.

Section of Ophthalmology.

President: A. J. Ballantyne, M.D., F.R.F.P.S. (Glasgow).

Vice-Presidents: J. Lockhart Gibson, M.D., F.R.A.C.S. (Brisbane); F. G. Antill Pockley, M.B., Ch.M. (Sydney); H. M. Traquair, M.D., F.R.C.S. (Edinburgh); Lieutenant-Colonel R. E. Wright, C.I.E., I.M.S., B.A., M.D. (Madras).

Honorary Secretaries: J. Ringland Anderson, M.C., M.B., B.Ch. (Melbourne); Max Yuille, M.B., F.R.C.S., D.O.M.S. (Melbourne); J. H. Doggart, M.D., F.R.C.S. (London).

Glaucoma.

DR. H. M. TRAQUAIR (Edinburgh) opened a discussion on glaucoma, with special reference to medical aspects and early diagnosis. The form of glaucoma referred to by him was simple chronic glaucoma of primary type, characterized by increased intraocular pressure, and of unknown causation. The other forms, referred to as acute, subacute, congestive, or inflammatory, were merely exacerbations of the simple chronic process, though they were of advantage to the patient, since they served to draw attention to the condition. There were certain predisposing causes, such as hypermetropia, shallow anterior chamber, and small cornea; and the patients were usually elderly and of anxious temperament. In young patients there was usually a family history. Glaucoma was a bilateral disease, though a considerable time might elapse between the involvement of each eye; it was a disease of the patient rather than of the eye, and perhaps in the future the glaucoma patient might be recognized actually before the affection of the eye occurred.

The most important symptom was the presence of recurrent dimness of vision in one eye, lasting perhaps a few hours or a day, and disappearing spontaneously. Discomfort, lowering of light sense, disturbance of accommodation and watering also occurred, but more significant were diminution of vision and haloes, since these indicated exacerbations of pressure and might be present for years before cupping of the disk was observed or before an attack of acute or subacute glaucoma took place. The beginning of glaucoma was without symptoms, as might be proved by study of the contralateral eye in the subject of glaucoma when only one eye was as yet affected. Dr. Traquair pointed out that the rise of intraocular tension was so insidious in glaucoma that the disease might be relatively well advanced before the patient observed a diminution of visual acuity or before the condition was discovered in course of routine examination for glasses. It was in such cases that the tonometer was of great value, and it should be more freely used. Dr. Traquair was inclined to place the normal limit somewhat lower than that suggested by Cridland as the standard for the original Schiotz tonometer; he was very suspicious of eyes showing a tension of over 22. Even a normal tension did not exclude glaucoma, since there was a normal diurnal variation. A plan that he had found useful was the instillation of eserine; in the normal eye the alteration in tension was slight, if any; in the glaucomatous eye, even if the tension did not seem to be unduly raised, a fall occurred within an hour. On the other hand, he had not found that temporary mydriasis caused an increase in tension in such cases, and he did not hesitate to use such a drug as euphthalmin.

Another sign of value was field changes, though it was more helpful in prognosis than in diagnosis, for such changes could be present only when the glaucomatous change had been existing for some time. A period even as long as eight to ten years might elapse before field changes were manifest, but Dr. Traquair remarked that the greater the ophthalmologist's skill in detecting the earliest signs of field defects, the shorter would be this so-called preperimetric stage. Also the less prominent the other features of the clinical picture, the greater the value of perimetry in diagnosis and the greater the necessity for its careful application. From the point of view of perimetry these cases of suspected glaucoma could be considered in two groups, according as there were no obvious field change present, or as gross or easily detected defects were found. In the first group fell various types of case: no signs or symptoms might be present; symptoms alone might be present; ophthalmoscopic signs alone might be present; increased intraocular tension alone might be found; or various combinations of these might exist. In order to render perimetry a sensitive test in these cases the test object could be reduced in size, the distance from the eye could be increased, or the illumination of the room reduced. Dr. Traquair had found that the weakest stimulus reliable under clinical conditions was a one millimetre white object used at two metres on the Bjerrum screen. The early field changes of glaucoma were of two types: depression and the beginning of arcuate scotoma.

Dr. Traquair dealt in some detail with the depression of the central field, the "baring of the blind spot", described by Sinclair in 1906 as an early sign of glaucoma, the so-called "Bjerrum's symptom". This was undoubtedly the precursor of the arcuate scotoma, but the latter did not appear to grow out of the baring, but rather to arise independently. Dr. Traquair presented a number of illustrative case histories with perimetric charts to illustrate both this early change and the arcuate scotoma. This latter usually began between one pole, generally the upper, of the blind spot and the vertical margin of the field 10° or 20° from the centre. At first unconnected with the blind spot, it established connexion with it only in the later stages. He believed that the statement that enlargement of the blind spot was a pathognomonic sign of early glaucoma was unacceptable and that this misconception had arisen because of the employment of unduly large test objects. The scotoma was that of a nerve bundle area rather than that of a tracing of blood vessels, as appeared to be the case in the scotomata described by Seidel. It arose quickly, and for that reason was probably often missed; in any case it was not truly an early change. In conclusion, Dr. Traquair emphasized that glaucoma was to be diagnosed by the whole clinical picture, not by one sign alone; the only pathognomonic sign was increased tension, and this was not readily elicited in all cases.

LIEUTENANT-COLONEL R. E. WRIGHT (Madras), in his contribution to the opening of the discussion, said that academic work of recent years had clarified the conception of the mechanism productive of the primary glaucoma which operated in the posterior segment. In this connexion clinicians thought of two main modes, one associated with increased volume of the vitreous body and the other associated with the vascular bed. Such hypothetical considerations of mechanism, however helpful, were not satisfactory when the primary glaucomas were considered from the general medical aspect. The clinical investigator's concern was to find something more tangible, such as a recognizable generalized affection, with which he could couple this glaucoma symptom complex. There was one known disease, and only one, which filled this rôle, namely, epidemic dropsy. Unfortunately epidemic dropsy was not a sharply defined entity from an ætiological and pathological point of view. Certain investigators considered that it was but part of the beri-beri disease complex. Whatever it might be, it was of the utmost importance, inasmuch as it gave a lead to the clinical investigation of one of the greatest problems in ophthalmology. Epidemic dropsy occurred in those who ingested a certain type of rice. In India it was confined to Bengal. The Calcutta ophthalmologists had for years noted its important association with primary glaucoma. Clinical research had been organized in the Government Ophthalmic Hospital, Madras, with a view to establishing some other such association. The primary glaucomas were only too common with them in Madras, accounting for about 2% of the affections met with in approximately 20,000 outpatients. Their investigations had not shown any significant correlation with blood pressure, sex, race groups, food groups, the prevalent metabolic derangement diabetes, or the common vitamin *A* deficiency; nor had the biochemical examination of the blood or the vitreous in glaucoma patients helped. There was, as might be expected, an apparent association with the generalized degenerative changes loosely grouped under the term premature senility. These negative results had been paralleled in their attempts at medical treatment.

PROFESSOR W. A. OSBORNE (Melbourne) said it would be amusing if it were not a little humiliating to find that with each succeeding enthusiasm in physiology and pathology a new hypothesis was put forward to explain glaucoma. They knew that glaucoma was a diseased state, not merely of the eye, but of the body. Attempts had been made to unravel all the mysteries of glaucoma in terms of colloid swelling. With the vogue of histamine the causation was assumed in terms of this panergic agent. Vitamin deficiency had a few stalwart adherents. Today they were in the era of cholinergic and adrenergic humoral activation, and glaucoma had not escaped. He drew attention to the fact that in the eyeball they had, exclusive of fluctuations of narrow amplitude, a remarkable constancy of pressure in health, and he considered that the fundamental problem of ocular tension, namely, the regulation of a standard pressure, was the problem that called for investigation.

DR. J. LOCKHART GIBSON (Brisbane) hoped that he was not too optimistic in suggesting that an early recognition of very slight signs of myxœdema would aid in the recognition of incipient cases of glaucoma. He was collecting evidence that the administration of thyreoid might act as a preventive to the development of glaucoma. Glaucoma was a disease of later life. A degree of hypothyreoidism was apt to occur in later life. The lens was harder and sometimes larger in later life. Given this and the turgescence of the ciliary body, the passage of the interocular fluid from the vitreous chamber to the anterior chamber was impeded. They had learned that the colloid constituents of the blood plasma could not pass through the walls of undilated capillaries, but that they could pass freely through the walls of dilated capillaries. They had learned also that hypothyreoidism led to a dilatation of the capillaries. Given, therefore, distension of the vitreous chamber with colloid and the further distension due to the osmotic effect of this increased colloid constituent in inducing a passage of the fluid of the blood into the vitreous chamber, the lens and iris were pushed forward and the shallow anterior chamber of acute glaucoma was produced; this occurred unless the passage for the denser fluid from the vitreous chamber to the anterior chamber was very free. He suggested that in chronic glaucoma the filtration angle became gradually interfered with and the deep anterior chamber of chronic glaucoma supervened. In cases of glaucoma he had been in the habit, for a few years, of advising thyreoid treatment and of encouraging patients whose one acute glaucomatous eye had been successfully operated on, to take thyreoid in the hope of preventing the good eye from being attacked.

DR. W. F. ORR (Melbourne) said that he regarded tension of over 22 millimetres with suspicion, and he had no doubt that his experience had provided justification for this suspicion. He found it difficult to believe that the pressure effects of tensions below 30 millimetres were sufficient in themselves to produce the visual defects which were grouped under the term glaucoma. Further, in secondary glaucoma a moderately high tension appeared to be tolerated much better than in primary glaucoma. He expressed his appreciation of the beautiful precision of the scotometric work of Dr. Traquair in the dark adapted eye.

DR. E. L. GAULT (Melbourne) remarked that, so far as the investigations of glaucoma went, they appeared to be in the region of interested speculation rather than ascertained fact. The matter of early diagnosis was of peculiar interest. If they were able to see patients in the early preperimetric stage, it would be an advantage to them and would largely influence the methods used in therapy. If it were possible to diagnose glaucoma in this early stage, it would be reasonable and right to indulge much more frequently in the treatment of the disease by non-operative measures.

DR. W. A. BOX (Melbourne) reported a series of twenty-one glaucomatous cases examined with the gonioscope. He emphasized the usefulness of this instrument in the elucidation of the angle of the anterior chamber in glaucoma, in the diagnosis of cases of incipient glaucoma, and as a guide to the treatment of a particular case.

DR. N. BISHOP HARMAN (London) said that he was an unconvinced opponent of the contention that glaucoma was a disease of the body rather than of the eye. He considered that the ophthalmoscope and the screen were the chief instruments upon which to rely. He used a screen with a self-recording chart, working at a distance of one-third of a metre. With the ordinary Bjerrum screen he thought that too much time was taken up and the patient became exhausted in the examination. Reduced illumination was invaluable.

DR. J. H. DOGGART (London) said that there was one simple way, not already mentioned, in which early glaucoma could sometimes be detected, namely, when pulsations of the retinal vessels were discovered after instillation of a mydriatic.

DR. EDWARD RYAN (Melbourne) asked for further information about those cases of malignant glaucoma which, no matter what treatment, operative or otherwise, was employed, progressed until ultimately removal of the eye was necessary.

DR. J. RINGLAND ANDERSON (Melbourne) said that he was making use of a particular kind of perimeter, made locally; a rheostat could reduce the illumination to a desirable point, and by comparison of the results thus obtained with those obtained by full illumination information of particular value could be obtained in the early diagnosis of glaucoma. At the Alfred Hospital patients with glaucoma were being more carefully investigated medically. Renal efficiency tests were being carried out, blood sugar and serum calcium estimations were being made, and the acetylcholine content of the aqueous was being estimated when possible.

Dr. H. M. Traquair, in reply, doubted very much whether the cause of glaucoma would be found in the eye. Lieutenant-Colonel Wright's remarks on the association of glaucoma with epidemic dropsy was one indication that the cause of glaucoma was not in the eye. A tension of

over 22 millimetres he would regard with suspicion, and he would possibly instil eserine and make another test in half an hour. With regard to Dr. Bishop Harman's remarks concerning the Bjerrum screen, he used it because it was such a quick method.

Lieutenant-Colonel R. E. Wright, in reply, said that he was in agreement with all that Dr. Traquair had said. There was one point which might be emphasized: actual tension was of no value whatever; it was the relative tension that counted.

The Definition and Causes of Blindness.

SIR JAMES BARRETT (Melbourne) read a paper on the definition and causes of blindness. He said that there were about 1,100 blind persons in Victoria, but pointed out that there were no means available of ascertaining the causes of blindness. He showed a table setting out the details of 192 applications to the Institute for Trade Education during the period 1901 to 1923. The high place occupied by optic atrophy, chorioiditis and *ophthalmia neonatorum*, with some other diseases less numerous, justified the conclusion that about half the cases were caused directly or indirectly by venereal disease. In another table Sir James Barrett showed the causes from 1923 to 1933. Two major increases had taken place — in myopia and *retinitis pigmentosa*. *Ophthalmia neonatorum* had definitely decreased, and trachoma showed a slight decrease. In a third table he showed the whole causes from 1901 to 1933. From the tables there emerged the fact that myopia occurred often in early life. The theory of the production and increase of myopia as a result of the over-use of the eyes could not have a universal application. Gross myopia must be due to biochemical developmental changes, possibly in some cases remotely syphilitic in origin. The increase of blindness due to *retinitis pigmentosa* and myopia was disturbing and was most difficult to control.

There emerged the question of the definition of blindness. At the Australasian Medical Congress (British Medical Association) held in Hobart in 1934, it had been agreed that blindness meant inability to count fingers at a distance of one metre in any circumstances. But between blindness and vision so defective as to render the subject unable to follow any occupation involving vision there was a gap. It had been agreed that partial blindness (or, as Sir James Barrett preferred to call it, partial sightedness) was the possession of vision of $^6/_{60}$ or less in any circumstances, but that nystagmus or contraction of the field might involve in odd cases the possession of a somewhat higher standard. He had known an albino with $^6/_{60}$ vision in both eyes, with glasses, conduct with success the business of a farm. There arose the problem of educating those whose vision was above these two standards, but which might be $^6/_{36}$ or $^6/_{24}$. In this respect the recent monograph issued by the Board of Education in England was most helpful. It was necessary to separate those suffering from a fixed and non-progressive defect from those with myopia, which might and often did progress unfavourably. The following principles stated in the monograph should be seriously considered:

1. Education of these persons should not be undertaken in special schools, but in special classes in an ordinary school, and, as far as possible, the two groups should be considered separately.

2. In such special classes good illumination and suitable print should be a first consideration, together with good hygienic conditions and suitable school furniture.

3. The games for such children required special attention.

It seemed to Sir James Barrett that much might be done by the proper use of the cinema and the use of the gramophone with amplifiers. The number of such children was undoubtedly considerable and the practical problem of arranging their grouping and transport became highly important.

Abnormal Retinal Correspondence in Squint.

DR. T. A'B. TRAVERS (Melbourne) opened a discussion on abnormal retinal correspondence in squint. He explained that the term referred to an abnormal functional relationship of the two retinæ, in which the two maculæ were not corresponding points. An abnormal retinal correspondence was in no way comparable with a "false macula". In the latter condition the central visual acuity of a squinting eye had become so low that it was worse than the visual acuity of the peripheral retina. A false macula was a monocular condition. An abnormal retinal correspondence was a binocular condition and was in no way dependent upon or related to visual acuity. Dr. Travers explained the difference between normal and abnormal retinal correspondence by an example of a squinter looking into a synoptophore. He was shown two simultaneous perception slides, such as the butterfly and the net. The instrument was set at his angle of squint, so that the image of the net was falling on his left macula and the image of the butterfly on his right macula. If the patient saw the butterfly in the net his retinal correspondence was normal; if he saw the butterfly outside the net it was abnormal.

An abnormal retinal correspondence was the result of the brain's reaction to an abnormal position of the eye. It was more likely to occur if the angle of squint was great and if the age of onset was early. The longer the ocular deviation persisted, the worse was the outlook for a return to normal correspondence. The lesson was thus fairly clear. When a patient had an abnormal correspondence one should get the eye straight as soon as possible if one desired to obtain binocular vision. Therefore, in Dr. Travers's opinion, operation should be performed on these patients as soon as a diagnosis was made.

DR. G. A. POCKLEY (Sydney) emphasized the importance of obtaining the intelligent cooperation of the parents in the treatment of a child with squint. The psychological aspect was often very important.

DR. J. RINGLAND ANDERSON (Melbourne) and DR. BRUCE HAMILTON (Hobart) said that it was absolutely essential that all cases of squint should be investigated thoroughly with the synoptophore and that orthoptic training should be carried out if indicated.

Iridocyclitis.

DR. J. H. DOGGART (London) opened a discussion on iridocyclitis. He said that ophthalmologists were feeling more bewildered than ever at the problem of the causation of this condition, since much of the recent information was of a negative character. Firstly, tuberculous infection had been blamed by Continental authorities for causing 50% of the cases, though the average English-speaking ophthalmologist would place the percentage at less than 5. A reaction to a tuberculin test was no proof of a tuberculous cause, as the reaction might be caused by another focus of disease; nor was improvement with treatment by tuberculin sure evidence of the ætiology, since Wright believed that tuberculin could augment the immunity to other organisms.

Similar difficulties arose with syphilis. The therapeutic test was here equally fallacious, though the occurrence of a Herxheimer reaction in the eye was a convincing phenomenon. Response to treatment, even in known syphilitic cases, was not invariable; some cases improved, others remained stationary, or might even get worse. Dr. Doggart cast doubt on the value of the Wassermann reaction in iridocyclitis and quoted the disturbing figures of Penrose, published in 1933, in which duplicate samples of blood serum were examined by two independent laboratories with concordant results in only 2·2%.

Then with regard to focal sepsis, Dr. Doggart referred to the theories of intestinal intoxication, dental and tonsillar infection. He pointed out how very difficult it was either to sustain or to deny the hypothesis of dental or tonsillar infection. Those observers who were convinced of its truth pointed out that many people might suffer from such types of sepsis without having iridocyclitis, just as many swallowed or inhaled tubercle bacilli without contracting frank tuberculous infection. They also claimed an ætiological relationship to be proven when removal of a focus was followed by cure, and explained the cases of failure by assuming that their toxins had already diffused widely into the tissues, there setting up spoiling or

sensitization to other agents. The same difficulty arose with prostatic infections. It could be said that the production of an inflammatory reaction in the eye could be well due to organisms or toxins escaping into the blood stream from the teeth or other foci, but Dr. Doggart believed that the tooth bogy had been absurdly exaggerated. His main reason for this belief was that there was no characteristic clinical type of dental iridocyclitis. In gonorrhœal iridocyclitis, for example, though there was no identity of all cases due to this cause, there was a well-marked clinical type. Males were affected more than twenty times as often as females, probably owing to the greater length and tortuosity of the male urethra with its accessory glands. There was often a characteristic massive coagulation in this type of iridocyclitis, which might occur before as well as after the onset of arthritis and which tended to relapse and to become bilateral. Dr. Doggart's impression was that irritation from atropine and other mydriatics was more common in the gonorrhœal than in the other types.

There was no general agreement as to the relative frequency of the various cases, but the average ophthalmologist would admit uncertainty as to the main cause of iridocyclitis in a higher proportion of cases than would have seemed obscure to his predecessors. Admitting all the non-traumatic causes, such as gonorrhœa, syphilis, tuberculosis, zoster, typhoid, influenza, septicæmia, malaria, leprosy and diabetes and perhaps rheumatism (though this was doubtful), there remained a large group the ætiology of which could not be determined. This residual group was attributed by some observers to tuberculosis, by others to sepsis, and was regarded as of unknown causes by still others. But it would seem that metastatic iridocyclitis was caused by some noxious substance, bacterial or non-bacterial, conveyed to the eye by blood or lymph channels, and favoured by special elective adaptations of this noxious agent or by allergic sensitization in the eye itself. Uveitis had been caused by intravenous or intraocular injection of many different substances in animals, but the clinical value of this work could not yet be summed up. Dr. Doggart briefly referred to the mysterious type of heterochromic cyclitis in which the process affected only one eye and caused bleaching of the iris; speculation as to the rôle of trophic sympathetic nerve fibres had recently been made by Williamson-Noble. Distinction should be made from other conditions in which heterochromia occurred. He also remarked on those obstinate cases of iridocyclitis in middle-aged or elderly women, usually without obvious cause.

In the treatment of iridocyclitis the use of local heat and mydriatics was obvious, and most people would in addition advocate the removal of any manifest septic focus if this could readily be done. Salicylates were regarded as valuable by many, and others had faith in milk injections and tuberculin. Dr. Doggart was sceptical of the value of protein therapy, and pointed out that the results of treatment were difficult to assess.

Finally, he urged that new discoveries in the ancillary sciences did not lessen the need for care in clinical scrutiny. However important pathological and radiological investigation were, still more important was the adequate examination of the eye itself, and clinical vigilance was still needed if further differentiation was to be made between the various types of iridocyclitis.

Dr. Leonard Mitchell (Melbourne) said that in Australia tuberculous infection could be held responsible for even less cases of the condition than in England, while syphilis in Australia, as in most countries, was decreasing every year. Much rubbish had been written on the subject of dental sepsis as a causative factor, and one could hardly be blamed for holding up to ridicule some of the more preposterous deductions. As a method of protein shock therapy he had been using lately a preparation known as "Sulphosin"—1% sulphur in olive oil, free of fatty acids. The dosage was one cubic centimetre for a trial, followed usually by two cubic centimetres, to give rise to a temperature of 104° F. on at least four consecutive occasions, while increases up to twelve cubic centimetres might be given with safety.

Dr. Adelaide Gault (Melbourne) presented a synopsis of twenty-five cases of iridocyclitis seen in the eye department of the Alfred Hospital, Melbourne. Briefly, her conclusions regarding treatment were that, apart from instillation of atropine, tonsillectomy gave the best result; the result of teeth extraction was disappointing. The arsenicals and mercury were not helpful, except in their specific capacity. Sodium salicylate and potassium citrate had been used only as a forlorn hope and had not really been tried in early cases. It was impossible to come to any conclusion as yet, but the idiopathic cyclitides and even the gonorrhœal and possibly the syphilitic cases did appear to fall into line with the ever-increasing number of allergic phenomena, and investigation along those lines might prove helpful.

Dr. J. F. Spring (Melbourne) was interested in the speculation that infection might come from the large bowel. He instanced his own case; he had a large bowel infection for years, and after trying various drugs found that fifteen grains of aspirin taken four times a day for a month controlled the condition. He thought that aspirin acted as a bowel antiseptic. In cases of iridocyclitis in which he could find no cause he had been giving aspirin in large doses, and in some instances he had obtained success.

Dr. J. Lockhart Gibson (Brisbane) said that the Wassermann test had often proved a disadvantage in medicine because of the credence placed on the negative result. He had often proved that the Wassermann test was unreliable. In syphilitic iritis he never used arsenical preparations, but found that the condition could be cured with mercury inunctions. If he were doubtful about syphilis being the cause, he placed the patient on sodium salicylate for a few days and then on mercurial inunction. He did not believe that the term idiopathic iridocyclitis was justified. He thought that the condition was due either to a focal or constitutional cause. It was important to treat the constitutional cause before looking for a focus.

Dr. N. Bishop Harman (London) stressed the value of potassium iodide in treatment; he gave fifteen grains three times a day for a week intermittently, together with large quantities of fluid. The old simple operation of paracentesis was also useful.

Dr. Mark Gardner (Melbourne) instanced two cases in which the removal of the gall-bladder had resulted in the clearing up of the iridocyclitis, and also one case of sympathetic iridocyclitis which had cleared up with large doses of sodium salicylate.

Dr. J. A. O'Brien (Melbourne) said that he had had some experience with the administration of milk as protein shock therapy; he found it useful chiefly in cases of acute iridocyclitis when they seemed to need some fillip to resolution.

Dr. G. A. Brookes (Sydney) had found bowel wash-outs in several cases most effective. After everything else had been done he had the stomach investigated for streptococci and, if they were found, he gave the patient a streptococcal vaccine and administered hydrochloric acid.

Lieutenant-Colonel R. E. Wright (Madras) remarked on the great difficulty of proving anything definite bacteriologically in connexion with the eye. It was not known whether an organism was present in the eye or whether a toxin was responsible. It was very doubtful whether malaria gave rise to iridocyclitis. On the other hand, there was a definite clinical association between dysentery and iridocyclitis. He felt that ophthalmologists were being driven back to allergy to account for much of the behaviour of the uvea, and that in allergy there was a most interesting field for investigation of the problems of iridocyclitis.

Dr. A. J. Ballantyne (Glasgow) stressed the fact that there should not be undue pessimism about these cases. Although one's treatment had to be empirical, he believed that persistent treatment gave cessation of the disease in the great majority of cases. Tuberculin he used a good deal, not purely on specific grounds; small doses in repeated courses were often helpful.

Section of Orthopaedics.

President: Professor E. W. Hey Groves, M.D., M.S., F.R.C.S. (Bristol).
Vice-Presidents: L. O. Betts, O.B.E., M.B., M.Ch. (Adelaide); S. T. Irwin, M.Ch., F.R.C.S. (Belfast); S. Alan S. Malkin, M.B., F.R.C.S. (Nottingham) (also acting as Home Secretary); J. Renfrew White, M.B., F.R.C.S. (Dunedin).
Honorary Secretary: Thomas King, M.B., F.R.C.S. (Melbourne).

Fractures of the Neck of the Femur.

DR. E. W. HEY GROVES (Bristol) opened a discussion on fractures of the neck of the femur. He pointed out that when Smith-Petersen first demonstrated his new pin and nail at a surgical gathering in London in July, 1929, not many of those who heard him were greatly impressed either with the theory or practice that he proposed. No one had realized that his proposition was going to dominate the whole situation in a few years. He therefore paid a tribute to the genius of Smith-Petersen.

Regarding non-union, mobility and want of apposition were the dominating factors; the poor blood supply of the head of the bone and the interposition of capsule between the fragments had to be reckoned with. The three essentials for success were accurate apposition of the fragments, firm fixation, and the removal of intervening avascular tissue. To achieve the ideal of early restoration of function, it was desirable that treatment should be undertaken early—within a week or two of the accident. The fixation should be of such a kind as to allow early movement and weight-bearing, and to avoid prolonged immobilization in bed. If these premises were admitted, it logically followed that the Smith-Petersen operation or principle should be regarded as the routine method of treatment. This technique owed its efficiency to three points: (i) The radiating blades of the nail fixed the fracture in regard to rotation in a way that no other method did. (ii) The shape of the nail made it possible to get complete penetration of the neck and head with the minimum of drilling or destruction. (iii) The impaction involved in first driving in the nail and then hammering the fragments together insured the closest possible apposition. The original Smith-Petersen operation exposed the seat of the fracture, permitted the removal of intervening fibrous tissue, and allowed fine details of adjustment, none of which was permitted by the more recent modifications. Interposition of fibrous tissue really did occur; and no one would doubt that there were certain displacements of the proximal fragment which could not be perfectly adjusted except by direct leverage on the head of the bone. The Smith-Petersen operation should always be carried out, provided: (i) the case was fairly recent, (ii) there was no marked absorption of the neck or necrosis of the head, (iii) the patient was not too old or feeble.

Whitman's operation should be reserved for those who refused open operation. Dr. Hey Groves said that he would not consider debility an indication for the use of the Whitman plaster method. The blind plaster method never had achieved, and never could achieve, more than a 50% or 60% proportion of success.

Regarding methods of introducing the Smith-Petersen nail, Dr. Hey Groves referred to the wire guide suggested by Jerusalem and by Johannson. This technique had captured the surgical fancy, but time would show whether it was the best. The whole process, with the waiting for X ray films, was tedious in the extreme, and seemed to him to be a complication rather than a simplification of the original Smith-Petersen technique.

The great attraction about the blind operation was that it was done through a small incision. Dr. Hey Groves referred again to the Johannson method, and said that the alternative was the method used and described by King—it was practically the same as that employed many years previously by Noordenbos, who used a fibular graft and the same topographical guides as King used. This operation was that most suitable for elderly and feeble patients, and it might, of course, be done under spinal anæsthesia.

Regarding after-treatment, it seemed to be taking unnecessary risks to allow the patient to raise the leg a few days after operation by voluntary effort and unaided. Of the alternatives, the use of a spica and the use of a walking caliper, Dr. Hey Groves preferred the latter.

Dr. Hey Groves was not convinced that anything was to be gained by operative treatment of this fracture in very old and feeble patients. It was necessary to exercise a balanced judgement about each doubtful case. The method devised by Hamilton Russell was suitable for some of these patients. The patients usually had not very long to live, but with this method their invalidity would be comparatively comfortable. At the present time there was some danger of Smith-Petersen's method becoming discredited because it was used for cases in which failure was inevitable. As far as non-union was concerned, the reunion of the fracture by open operation should always be the operation of choice, provided the patient was reasonably healthy and active, and provided also that there was neither necrosis of the head of the bone nor absorption of its neck.

DR. S. J. IRWIN (Belfast) said that the treatment of fractures of the neck of the femur might be divided chronologically into four periods, excluding that period at which no treatment at all was practised: first, the period of treatment by fixed extension or extension by weight and pulley before the introduction of Whitman's plaster method; secondly, the period of Whitman's method; thirdly, treatment by autogenous bone graft; fourthly, the modern method of treatment by the Smith-Petersen nail. In the first period Dr. Irwin had treated patients by weight extension. The surprising fact emerged that among fourteen such cases union occurred in nine. His experience of treatment by Whitman's plaster and by the autogenous bone graft was similar to that of other surgeons. His practice in introducing the Smith-Petersen nail was to use the open operation as originally described by the originator.

DR. J. W. HOETS (Sydney) said that the treatment of fractures of the neck of the femur depended on whether one decided to use a nail, and, if so, how to introduce it. If a nail was to be used, it was necessary to be certain that the fracture was adequately reduced, and for this purpose radiographs taken in two planes were essential. The lateral view could be taken on a curved casette. It was as necessary to provide complete fixation of the fragments as in fracture of any other bone, and the Smith-Petersen nail was the logical method to use. Concerning the methods of introduction, it was beyond argument that open operation would be required in old cases in which scar tissue might be expected between the fractured surfaces. In recent fractures the subcutaneous method was perfectly satisfactory. The time taken in this operation might be tedious to the operator, but did not distress the patient. The wound was much smaller and the risk of sepsis much less. Contrary to the views of some surgeons, Dr. Hoets believed that the senile patient was the one who stood to gain most.

DR. THOMAS KING (Melbourne) said that he had no doubt about the desirability of using the Smith-Petersen nail, and he proposed only to discuss his method of introducing

it. The method which he practised had been evolved by himself independently, although other surgeons, particularly Johannson, had popularized the method in Europe. Dr. King had treated forty-eight cases of fractured neck of the femur, all intracapsular, in the past three years. In the first four he employed the original wide exposure described by Smith-Petersen, but the results for one reason or another were very unsatisfactory. Of the remaining cases, eleven were not operated upon, and for the remaining thirty-three he had employed the method which he had previously published. There was but one death—from pulmonary embolism on the following day. Five other cases were more or less unsatisfactory. Of the remainder, good bony union had occurred in twenty cases, and seven others were still under observation.

DR. S. A. S. MALKIN (Nottingham) said that old ununited fracture presented a slightly different problem. He showed X ray films of such a case which he had treated by an osteotomy at the level of the lesser trochanter. The upper end of the shaft was displaced medially until it lay directly under the site of fracture. This was designed to give the patient a more stable hip, but one unexpected result was that union of the original fracture occurred. While this might be a happy accident, it was a useful procedure, even when union did not occur.

DR. D. J. GLISSAN (Sydney) wished to add to Professor Hey Groves's list of indications for the operation one more requirement, namely, that the surgeon should be competent to handle the method he selected. Australia was a country of large distances, and he would not like it to go forth that those present considered that there was only one way to treat this troublesome fracture. Students should be given an alternative; they should be taught how to apply Whitman's plaster effectively and how the patient should be nursed thereafter. Smith-Petersen had evolved the present form of his nail with the object of preventing rotational displacement at the fracture site, but there were other methods of attaining this same end. A carpenter presented with a similar problem would use two ordinary nails, and he believed that ultimately two Kirschner wires would be used for this purpose. If they were placed as accurately as Dr. King had proved he could place them, they would be as satisfactory as the Smith-Petersen nail. He advised Dr. King to try this suggestion.

DR. C. W. LITTLEJOHN (Melbourne) said that he had elaborated a method of approach to the fracture differing from that usually practised. Through a lateral incision he removed the great trochanter with a Gigli saw, which gave easy access to the fracture site through the thinnest part of the capsule. The operation could be done under local anæsthesia. He no longer advised the patient to commence walking immediately after the operation.

DR. HUGH TRUMBLE (Melbourne) demonstrated a splint, to replace the walking caliper, which he had already described in *The British Medical Journal*.

Professor Hey Groves, in reply, said that he did not intend to suggest that Smith-Petersen's method was the only method of treating these fractures. Even after Dr. King's excellent demonstration he was still unconvinced that the subcutaneous method would last, and he was very favourably impressed by Dr. Littlejohn's procedure, on account of the small incision employed. He would take back to England a sample of Dr. Trumble's splint, which he greatly admired. He would tell the Customs officers that it was a shooting stick which Australians used when shooting kangaroos.

Osteoarthritis of the Hip and Knee Joints.

DR. J. FORBES MACKENZIE (Melbourne) opened a discussion on osteoarthritis of the hip and knee joints. He said that the changes in osteoarthritis and in the condition known as rheumatoid arthritis were more or less similar, and that the two conditions were essentially the same in origin. He believed that all conditions classified as osteoarthritis and rheumatoid arthritis were the result of a primary osteitis and that arthritic changes were secondary—in other words, that anything which happened to the joint was the result of something which had happened to the bone. Dr. Mackenzie then went on to describe the operative treatment adopted by him in all cases of osteoarthritis and rheumatoid arthritis; and he referred to the articles on the subject written by him and published in THE MEDICAL JOURNAL OF AUSTRALIA of April 11, 1931, and of December 3, 1932. He stated that many patients were improved by the simple procedure of opening up the bone in the neighbourhood of the affected joint. Improvement was manifested by relief of pain, improved health, an altered outlook on life, and an improved blood picture. Restoration of function, while slower, did occur. He stated that there was reason to think that articular cartilage, unless hopelessly damaged, would recover as a result of the procedure. The progress of the disease was stayed, and recurrence was exceptional, and, when it did occur, it was only in the nature of a slight flare up, which could be dealt with by local opening of the bone. The procedure was simple, it was unaccompanied by shock or unfavourable sequelæ, and it did not call for a long stay in hospital or for expensive after-treatment. Dr. Mackenzie said that the number of patients on whom he had operated for hip and knee joint involvement was 106. The average duration of disease when hip and knee joints were involved, either together or separately, was over six years. He concluded that an improvement really worth while could be expected in 80% of cases. Naturally, the older the patient, the worse was the prognosis.

DR. S. A. S. MALKIN (Nottingham), in his opening paper, dealt with the use of femoral osteotomy in the treatment of osteoarthritis of the hip joint. He said that the operation that he used had been mentioned by both Page and Bristow and had been advised by Hey Groves. He said that the problem of the arthritic hip was mostly one of pain; it was therefore necessary to know how and why pain occurred. He referred to the ætiology of the condition as summarized by Elmslie, the factors being classified as traumatic, mechanical, toxic, and local disease of the articular end of the bone. Whatever the cause of the condition, there was no doubt that the final result was a disparity between the two bony components of the joint. As a result, faulty mechanics induced a strain, mostly taken by the inelastic fibrous structures surrounding the joint, and resulted in producing muscular spasm, which increased and maintained the deformed position. Dr. Malkin discussed the movements of the normal hip in walking, and he showed that in an osteoarthritic joint a strain occurred at each step and that the strain was borne by structures not designed for the purpose. An apparently useful range of movement, if in the wrong position or plane, might be useless or a source of weakness. It was in accordance with sound orthopædic principles to correct faulty mechanics and, if possible, to utilize the movement by altering its plane. In some cases of monarticular arthritis of the hip this could be done by a simple osteotomy.

Dr. Malkin described his operation and said that he had performed it fourteen times during the last few years with no operative mortality and practically without any appreciable operative or post-operative anxiety. The results so far had been satisfactory. Dr. Malkin recognized that his series was too small to justify the drawing of any conclusions, but he felt that the operation might in certain cases be substituted for the methods generally advocated.

DR. G. D. KERSLEY (Bath) was much impressed by Dr. Forbes Mackenzie's paper and results, but he could not agree with the sweeping negative that every other method of treatment was ineffective; and he also disagreed that all types of arthritis were the same. As regards osteoarthritis, sepsis was not the main ætiological factor, but trauma and nutrition played a large part. By trauma he meant, not gross injury, but repeated small injuries, caused, for instance, by faulty weight-bearing. Osteoarthritis of the knee might be caused by flat-foot. His treatment was directed against these two causal factors. Rest, reduction of weight, and splinting relieved the traumatic factor, and local heat by baths, mud-packs, and diathermy, counter-irritants and endocrine therapy were practised to improve the nutritional state. The most important thing was to study the case from every aspect.

Dr. S. H. Scougall (Sydney) described the work in the arthritis clinic at the Royal North Shore Hospital of Sydney. His views were the result of the joint study of Dr. Hamilton and Dr. Ducker and himself. The methods of treatment at this clinic included all the usual methods outlined by Dr. Kersley and, in addition, dietetic measures and treatment by manipulation. They used a modified diet, after Pemberton, with a low caloric value, with special limitation of carbohydrates. Occasionally this gave complete symptomatic relief. Manipulation in quiescent cases gave much temporary and sometimes permanent relief. In his view the relief from symptoms was at least partly due to improvement in the patient's posture. He had also noticed that in cases of rheumatoid arthritis complete relief sometimes followed any operation, for six or eight weeks, a fact which was as difficult to explain as the gratifying results which Dr. Forbes Mackenzie had described. Only five patients had been treated by Dr. Forbes Mackenzie's methods in this clinic, and they were patients who had not responded to the usual routine methods. He had to confess that he was disappointed with the results, and one patient in particular had become much worse.

Dr. J. B. Colquhoun (Melbourne) wished to vouch for Dr. Forbes Mackenzie's satisfactory results, which he had duplicated in his own practice. At first he was very sceptical, but was now completely convinced. He now believed that it was not necessary to bore such large holes as Dr. Forbes Mackenzie did, and believed that multiple small drill holes gave equally good results.

Dr. Marion Taylor (Perth) said that she had practised Dr. Forbes Mackenzie's methods in about one hundred cases with only two failures, and was very enthusiastic. She described in detail the histories of several patients who had made immediate and rapid improvement after she had bored the lower end of the femur and the upper end of the tibia. The improvement was just as striking in joints, such as the ankles and fingers, remote from the site of operation as in the knee joint.

Dr. Forbes Mackenzie, in reply, thanked members for their patience, but had nothing to add, except that his experience of manipulative treatment had been dreadful.

Osteoarthritis.

Dr. L. J. A. Parr (Sydney) read a paper on the experimental production of osteoarthritis in rabbits. He said that the pathological features of osteoarthritis were sclerosis of bone and osteophytic outgrowths in contradistinction to those of rheumatoid and infective arthritis, which were the formation of a pannus and rarefaction. He classified the types as follows: (i) traumatic, as in fractures *et cetera*; (ii) endocrine, climacteric arthritis, often associated with subthyreoid stigmata; (iii) senile, supposedly due to endarteritis of the nutritive vessels of the joint capsule; (iv) osteoarthritis associated with congenital syphilis; (v) osteoarthritis occurring in diseases of the central nervous system, such as tabes and syringomyelia; (vi) osteoarthritis associated with gout; (vii) an indeterminate group in which none of the above causes could be assigned. He asked what was the rôle of infections in these groups and what was the organism involved. He quoted extensively from the literature to show that infection might play a part in the causation. Osteoarthritis had been produced experimentally by incision of the cartilage of the knee and by injection of the *Streptococcus viridans*.

He himself had undertaken some experimental investigations, using broth or serum broth cultures twenty-four hours old. He had used the intraarticular route in preference to the intravenous route, and had experimented with five series of rabbits.

In 1927 the first series had been injected with *Streptococcus viridans*, mostly obtained from the bowel in cases of osteoarthritis. He had found radiographically that the changes produced were sclerosis of bone and premature union of the epiphysis and diaphysis. This series comprised four rabbits.

In 1928-1931 seven rabbits had been injected; some had survived for three years. *Streptococcus infrequens* (hæmolytic) had produced rarefaction typical of rheumatoid arthritis. *Streptococcus viridans* had produced all the changes of osteoarthritis, such as osteophytic outgrowths, bony sclerosis, cyst formation in the femur, calcification of the quadriceps tendon and patellar ligament.

In the third series, 1930-1931, five rabbits had been used. *Streptococcus viridans* had produced well marked osteoarthritis, the osteophytes and extraarticular calcification being pronounced.

In the fourth series twelve rabbits had been used. *Streptococcus viridans* and *non-hæmolyticus*, obtained from septic foci in osteoarthritis, had been employed. The changes produced had been those of osteoarthritis—bony sclerosis, cyst formation, osteophytes, lipping and extra-articular calcification. Dr. Parr claimed that the last mentioned observation proved that the toxin of these organisms could change a fibroblast to an osteoblast.

In a fifth series *Streptococcus pyogenes* had been used, but all the rabbits rapidly died.

Dr. Parr concluded that either the exotoxin or the endotoxin of *Streptococcus viridans* and *non-hæmolyticus* could produce typical osteoarthritis.

Fractures of the Spine.

Dr. S. T. Irwin (Belfast) opened a discussion on fractures of the spine. He pointed out that since the War surgeons had taken a great interest in injuries; and he stated that in his own wards at Belfast 10% of the available bed space was occupied by persons injured in motor accidents. He showed that in spinal injuries modern radiological technique had made it possible to demonstrate with the utmost precision the minute details of such fractures, and that as a result of this radiological technique the surgeon was able with greater ease and exactitude to apply treatment that was becoming more rational, more practical and more efficient. Hyperextension for crush fracture of the spine, though used by Robert Jones and advocated in combination with traction by Davis, was, in its present mode of application, a real discovery when first suggested by Watson Jones in 1930. This, added to the improvements in radiology, had revolutionized the management of all cases of fracture of the spine.

Dr. Irwin stated that the subject of spinal injuries was, broadly speaking, threefold: (i) fractures, (ii) dislocations, (iii) injuries to the soft tissues. He proposed to deal only with the first of these groups; and he based his remarks on 34 fractures of the spine occurring in patients admitted to his wards at Belfast. All three causes of fractures in general operated in fractures of the spine: direct violence, indirect violence and muscular violence. The chief cause was indirect violence. The site of the 34 fractures was as follows: cervical region, 3; upper and mid-dorsal regions, 2; lower dorsal region, 10; lumbar region, 17; coccyx, 2. Seven of the fractures involved the twelfth dorsal and eight the first lumbar vertebra. Dr. Irwin pointed out that crush fractures occurred in most typical form in the dorso-lumbar region, and that transverse processes were usually broken in the lumbar region. The transverse process fracture was, he stated, produced by a violent contraction of the *quadratus lumborum* muscle. For descriptive purposes he divided fractures of the spine into: (i) fracture of the atlas, (ii) fracture of the axis (these two occurring singly or in combination), (iii) fracture-dislocation in the cervical region, (iv) compression fracture, (v) fracture of the coccyx, (vi) fracture of spinous processes, neural arch, or transverse process.

Fracture of the atlas was a tension fracture and arose from a spreading outwards of the ring formed by the atlas. In 45% of cases the fracture was not fatal, owing to the fact that the cord escaped injury. When it was suspected, stereoscopic X ray films, both antero-posterior and lateral, should be obtained. Treatment in the absence of deformity entailed a prolonged period of immobilization in plaster of Paris, followed by the wearing of a leather collar. When deformity was present, reduction was required, and there was always a danger of the manipulation causing sudden death. Fracture of the axis might

be found in association with fracture of the atlas; its diagnosis was made in the same way as fracture of the atlas, and it was treated upon the same principles. The best that could be hoped for was union by a short fibrous band.

Fracture and fracture-dislocations in the cervical region below the axis were divisible anatomically into two groups, those above and those below the fourth segment. Injury above the fourth segment without cord lesion was usually a pure dislocation, though not seldom it was associated with lesions of the nerve roots. The prognosis was usually good. In fracture below the fourth segment with severe cord lesions the patient might live because the roots of the phrenic nerve escaped injury; the ultimate prognosis was bad. Dr. Irwin described three distinct types: (i) injury above the fifth segment, (ii) injury between the fifth and sixth segments, (iii) injury below the sixth segment. He described the characteristics of each of these and said that the main problem was whether reduction of any existing deformity should be attempted. The effect of reduction would depend on the exact nervous lesion.

Dr. Irwin then discussed compression fracture of a vertebral body and pointed out that it was the most important form of spinal injury. It was the commonest form of spinal fracture; about 40% of all spinal fractures were due to compression, and the majority of these occurred in the dorso-lumbar region; in 70% the patient escaped gross cord injury. The fracture might be complicated, but in a very large majority of cases the injury was confined to the compression of a single body without injury to soft tissues and without dislocation. It might be due to very slight violence or to gross violence. It was easily diagnosed by signs of local trauma and distinctive radiological appearances in an X ray film. It could also be easily missed if the patient failed to consult his doctor or if the nature of the injury passed unsuspected. Treatment depended on principles easily applied, and the results on the whole were good; failure to apply suitable treatment led to irreparable deformity with intractable and disabling symptoms. In discussing the morbid anatomy of these fractures, Dr. Irwin said that it was only in cases of posterior displacement of bony fragments or when dislocation complicated fracture that injury of the cord occurred, and such a complication arose most frequently in the cervical region. For details of the treatment of crush fracture Dr. Irwin referred his audience to the description of Watson Jones's method published in *The British Medical Journal* in February, 1931.

DR. F. C. PYBUS (Newcastle-on-Tyne) said that his experience corresponded with that of Dr. Irwin in regard to the statistical facts mentioned. Concerning treatment, he was not in favour of routine reduction and plaster application; each case should be treated on its merits. It was his practice in some cases to do no more than put the patient to bed and allow such movement as was permitted by pain. In other cases he also used Watson Jones's method of reduction and plaster fixation.

DR. J. B. COLQUHOUN (Melbourne) said that his experience of treating fractures of the spine was limited to one or two cases. For reduction of the deformity and application of the plaster he advised the procedure he was accustomed to use in cases of tuberculosis of the spine. He issued a word of warning against the indiscriminate application of plaster jackets by surgeons not conversant with plaster technique.

DR. THOMAS KING (Melbourne) disagreed with Dr. Pybus's statement that some patients could be treated merely by recumbency. In his opinion, all patients should be treated in plaster of Paris and encouraged to walk. He outlined his favourable experience in the treatment of bed-sores by a mixture of cod liver oil in vaseline.

The Rôle of Physiotherapy in the Treatment of Injuries in General and Orthopædic Practice.

DR. E. B. M. VANCE (Sydney) opened a discussion on the rôle of physiotherapy in the treatment of injuries in general and orthopædic practice. He said that the subject might be split into two main divisions: (i) passive physiotherapy and (ii) active motion. The first division embraced: (*a*) massage, (*b*) heat, (*c*) electricity, (*d*) passive motion. The second division included: (*a*) muscle reeducation, (*b*) remedial exercises to restore coordination and postural exercises, and for the final stage of rehabilitation of the injured, (*c*) occupational therapy and vocational training.

The tendency amongst those who watched and guided this work was to put more and more emphasis on the importance of active motion. As a corollary, the passive division of physiotherapy should be considered as of less importance than hitherto. It could be said of the latter that it was comforting and helpful; but it was the former which was curative. Evidence of this tendency was to be seen in the comparative disuse of the elaborately equipped physiotherapy departments which had grown up round the War hospitals. Further evidence was found in the abuse of the massage departments of public hospitals, which were liable to become the dumping ground for the refuse of both medical and surgical practice. The vague prescription of massage, or hot air and massage, seemed to engender a vague hope of cure.

The belief in a blend of massage and passive motion had been rooted in the human race from time immemorial. The uninitiated judged massage according to its vigor. This led to sad faults. To give heavy massage to paralysed muscles and/or passive motion to a joint in the throes of traumatic arthritis were minor calamities. Scientifically, massage should be used only with precise prescription. The prescription should specify the kind of massage to be used, the number of times, and the intervals at which it was to be used. For recent injuries massage played a useful and comforting part in the treatment of sprains, fractures, dislocations and septic compound wounds. In old injuries it reduced residual œdema of the skin and soft tissues. The part of heat was to hasten repair by promoting greater cellular activity. It also lessened pain and was an excellent preparation for active motion. Diathermy, hot air machines, hot water, arm and leg baths, whirlpool baths, sun-baking, hot sand and sea bathing, all these were available, useful and worth prescribing. After raising high hopes, electricity as a curative agent seemed to have a habit of letting them down. The Bristow coil, by producing painless muscle contractions, demonstrated to a patient that many a muscle of which he had lost voluntary control could still move, even without his will, and even indeed without his good will. Having shown him the muscle movement, the next thing was for him to make his mental effort to move it coincide with the movement imparted by the machine, until he learned gradually to do it for himself. Galvanic and faradic currents were brought into use for testing purposes in peripheral nerve injuries, and for their treatment. The faradic current played a part in the treatment of functional disabilities. For malingering it had a distinct use.

Passive motion was the most difficult and the most dangerous. It called for the greatest certainty of diagnosis before use. The pitfall was moving the not yet sufficiently recovered joint, which Thomas's test of recovery would have detected. To avoid such ills one should put back to rest any joint the range of allowed natural motion of which was decreasing, and, secondly, one should never manipulate under anæsthesia any joint which had little or no free natural movement in it. Adhesions were prevented, if possible, by one movement once a day. Adhesions were dealt with after formation by assisted active movements. In other words, they were stretched as much as possible with an active movement, then a modicum of passive stretching was added.

In active motion lay the sap of the matter in physiotherapy. It was only active motion that restored function to a part. Active motion called for voluntary effort. No massage, no heat, no machines, could from the outside bring back active motion. Splints imposed certain restrictions, but the skill of the physiotherapist was required to get the least possible interruption of function whilst repair was taking place.

The principles of muscle reeducation for muscles weak and wasted by injury were the same as they were for

poliomyelitis. There was the posturing, there was the giving the muscle a minimal task, there was the gradual daily increment of work. This demanded an intimate acquaintance with each and every muscle and its action—it was an art difficult to acquire and difficult to teach. The annual crop of stiff hands would be greatly diminished if the reeducation of the finger extensors and flexors, the lumbricals and the interossei was carried out adequately and correctly. Together with the particular work on particular muscles was the need of keeping alive the sense of coordination in the adjacent uninjured muscles and joints. In feet and back injuries one often found a disturbance of balance as a sequel. To prevent this occurring, or to help correct it when established, postural exercises were used. These, in orthopædic work, formed a highly important and technical branch. Occupational therapy was the post-war application of the wartime lesson of the curative workshop. Clay modelling, rug-making, chair-caning, to name but a few, threw the interest from the subject to an object and helped recovery enormously.

Dr. Vance concluded, first, that the essential processes of repair after injury took place independently of any of the passive artifices of physiotherapy; secondly, that the true rôle of physiotherapy in the treatment of injuries was to help the hesitant to help themselves.

Dr. S. A. S. Malkin (Nottingham) said that he found himself in agreement with Dr. Vance on all the points mentioned, but he felt even more strongly than Dr. Vance regarding the need for prescribing treatment in accurate terms. He quoted the report of the Committee on Fractures, urging the need for unity of control, and he described methods for insuring this unity of control and continuity of treatment. He thought that physiotherapy had fallen into disrepute for two reasons, namely, that the physiotherapeutist was often asked to achieve the impossible, and that long attendance at a massage department often engendered a state of mind in the patient inimical to recovery. He pointed out that while in the young little was needed, physiotherapy, properly supervised, was useful in the elderly for the sake of encouraging the patient. It was, of course, always needed after a manipulation, to maintain the range of movement by assisted active movements. The question of remedial workshops was coming to the fore in England, and they were more valuable than the usual type of massage department, because they maintained the interest of the patient. He stressed the point that much of the good results obtained in the physiotherapeutic department was attributable to psychotherapy.

Dr. C. W. B. Littlejohn (Melbourne) said that Dr. Vance's paper afforded him no excuse for argument. He stressed the necessity for active movement as soon as possible after an injury. If this was always practised, there would be less need for physiotherapy. He thought that Hilton's essays on "Rest and Pain" had done much harm. His plan was to exercise the muscles concerned until the patient could use them himself. He believed that the application of heat was of value in liquefying the exudate which followed an injury, but merely as a preliminary to exercise. Electrical stimulation was of great value in cases in which the patient had to be shown that the muscle was not incapable of movement, but was abandoned early. Passive stretching was useful if adhesions were soft, but forcible manipulation under anæsthesia was necessary in old cases. The psychological effect of physiotherapy was important—if the patient was a trier it was useless, if not harmful.

Dr. L. Betts (Adelaide) said that physiotherapy was unnecessary if active movement had been practised from the outset, and, in any case, massage, heat *et cetera* should be used only as adjuncts, and very definite indications should be present. The teaching of the limitations and benefits of physiotherapy in the curriculum was faulty and should be improved. He agreed with Dr. Malkin that continuity of control was an urgent necessity. He completed his remarks by saying that the greater the surgeon's skill and knowledge, the less his need of physiotherapy.

Dr. L. J. A. Parr (Sydney) accepted the challenge thrown down by the previous speakers, but he admitted that only in collaboration with the orthopædic surgeon could good results be obtained. His present practice was to employ a short period of treatment by radiant heat and then to return the patient to the surgeon for manipulation under anæsthesia. The patient should then be treated by assisted active movements and stretching. The teaching of physiotherapy in the curriculum was nil, and as a result doctors sent their patients to so-called "gymnastic institutes", because they were ignorant of what a trained physiotherapeutist could achieve.

Professor Hey Groves, the President, said he was very interested to observe that the beliefs on this subject in Australia coincided with those in England. He also desired to emphasize three important points: that active movement was infinitely more valuable than passive, that cooperation should exist between the fracture department and the physiotherapy department, and that progress in the future lay along the lines of working out forms of remedial exercises, for example in workshops.

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Honorary Secretaries: G. A. D. McArthur, M.D., F.R.A.C.S. (Melbourne); J. H. Shaw, M.B., F.R.C.S., D.L.O. (Melbourne).

Maxillary Sinus Suppuration.

Dr. John F. O'Malley (London) opened a discussion on the treatment of maxillary sinus suppuration. He said that he proposed to try to answer certain questions as follow: (i) What precedes sinus suppuration? (ii) Why is not maxillary sinus suppuration more universal? (iii) Why does it occur? (iv) How can it be got rid of? (v) What factors can we count on to promote a cure? Nasal sinuses, he stated, functioned under the physical laws which governed air movements generally in Nature, and should always be thought of in terms of "ventilation" rather than in terms of "fluid gravity drainage", whether the cavities might for the time being contain excessive secretion or not. In contrast to what obtained in an abscess of a solid organ, the purulent fluid, though unable to escape from the air space, was still outside the body tissues. Apart from the action of glandular secretions, the physical side of the physiological function of an antrum depended upon ciliary activity and air pressure variation currents which synchronized with those of the

nasal passages in each respiratory cycle. Both these were independent of gravity, but in Dr. O'Malley's opinion they were interdependent, as air currents provided the stimuli and need for ciliary activity. Both were capable of increased activity to meet special needs, but air pressure variation currents were the more mobile and expansive. They constituted a potent factor in causing the peculiar œdematous changes of the soft tissues associated with inflammatory processes in the nose and sinuses. In the absence of infection, and so long as ciliary activity and ventilation were efficiently maintained, the sinus remained healthy. Dr. O'Malley pointed out that increased ventilation air pressures could be exerted to overcome the increased resistance to nasal and sinus air currents produced by inflammatory engorgement. If the effort succeeded in restoring both negative and positive pressure phases, alternating regularly in each respiratory cycle, the sinus became normal on the subsidence of the vascular engorgement. If it failed to do so, sinus suppuration ensued and remained until ventilation was reestablished. In this regard Dr. O'Malley referred to the discovery of McGregor that after removal of the antral lining complete regeneration of the ciliated epithelium took place. In every acute coryza a sinusitis occurred as well as a rhinitis. During the active inflammatory process the ventilation of all the air spaces was impaired, but on subsidence of the infective reactions it was restored by ordinary respiratory effort. This supplied an answer to the question as to why maxillary sinus suppuration was not more universal. Failure of the sinus to recover its ventilation simultaneously with that of the nose implied the presence at the ostium of a physical barrier, vascular, structural or both. The origin of the infection, of course, had to be determined. This and other questions had to be answered before treatment was commenced.

Dr. O'Malley then discussed dental infections and showed that they were usually definite and arresting in their onset. He discussed the treatment briefly and pointed out that the sinus infection in these circumstances was not consequent primarily on failure of ventilation through the nose, but on infection from one of its walls. He referred to sinus vacuum pain and said that in the absence of intranasal factors likely to cause obstruction, the block to ventilation in acute dental infections was invariably due to a vascular engorgement, which subsided with removal of the offending tooth and lavage of the antrum.

In discussing infection by the intranasal route, Dr. O'Malley referred first of all to the catarrhal type. He disliked the term catarrhal—it was so vague. He pointed out, however, that in the absense of such definite conditions as vasomotor or atrophic rhinitis, sinus suppuration or polypus formation, there were a large number of persons who might be described as being "nose conscious". He thought that in these cases there was always a ventilation imbalance; the patients frequently caught cold and had passing attacks of mild sinusitis, ending one day in a frank suppuration. The acute inflammatory type of infection, though it occurred commonly in patients of the catarrhal type, also affected many others who had previously had a symptomless nose. In Dr. O'Malley's experience acute inflammation never became established in a well ventilated upper airway. Some intranasal factor capable of causing quick obstruction was generally to be found. Spontaneous subsidence might occur and relapse take place later on—a see-saw condition that later ended in chronicity, attended by soft tissue changes, and possibly polypoid formation. At this stage Dr. O'Malley asked what was the difference between acute and chronic types of infection. He referred to the contention of Killian that all cases of maxillary suppuration were chronic. He discussed this question and pointed out that most patients were seen when their infections had reached what was really a chronic stage.

In regard to treatment in the acute stage, it should be on general lines. Active operative procedures were contraindicated in the acute stage of any sinus suppuration. Even blowing the nose was to be deprecated. When ventilation was returning, inhalations and so forth were useful. If suppuration persisted, attempts at restoring ventilation were indicated. In regard to surgical treatment in the subacute and chronic stages, Dr. O'Malley discussed local vaso-constriction and lavage by puncture, depletion by scarification and antrostomy. He gave details of these procedures and then passed on to discuss very chronic and complicated antral suppuration. He insisted that the thorough removal of the œdematous, soft, more or less organized antral tissue was necessary to achieve a successful result; the complete integrity of the inferior turbinal bone, however, should be rigorously respected. The Caldwell-Luc operation, as at present performed, still held its place for cases complicated by gross œdematous changes in the lining, but in the absence of this complication and for recent suppuration the intranasal antrostomy—the really functioning portion of the Caldwell-Luc operation—should continue to be the operation of choice.

Dr. J. F. Woodburn (Sydney) said that acute cases usually responded to conservative treatment if not complicated by infection of other sinuses. In chronic cases dental causes should be excluded. The allergic factor should also be considered before operations were performed. He personally favoured the Canfield-Ballenger operation in selected cases.

Dr. Edgar Brown (Adelaide) drew attention to the increase of antral disease. In 1924 eleven operations for antral disease were performed at the Adelaide Children's Hospital, since when the number has steadily increased, until in 1934 it reached 75. In reviewing methods of treatment he said that he found the use of a 25% argyrol pack of great value in acute catarrhal rhinitis. In cases of antral infection following extraction of a tooth he favoured lavage combined with a high-fitting dental plate. Concerning scarification, as suggested by Dr. O'Malley, he had hitherto considered it an unsound surgical procedure, because of the risk of causing a spreading infection. Unsatisfactory operative results in children were sometimes due to imperfect removal of adenoids. In chronic antral disease with polypi he could see no satisfactory method other than a radical operation.

Dr. Douglas Guthrie (Edinburgh) said that a general investigation of the patient should never be forgotten. The internal administration of alkali was valuable in sinusitis, as well as in bronchitis. When allergic manifestations were present the allergy should first be treated. It was said that maxillary sinusitis was commoner in Australia than in Europe. This might be due to the fact that all Australian cities were on the seaboard and that sea bathing was an important cause of sinusitis. Lavage of the antrum should be more frequently performed, so that many latent cases in which no pus appeared in the nose on examination, would be detected and treated. Complete removal of the antral mucous membrane was seldom justifiable. The choice of operation—nasal antrostomy *versus* radical operation—would remain a matter of individual choice, but the rhinologist was wisely becoming more conservative. Further inquiry into non-operative methods of treatment, such as ionization, diathermy and internal medication, was required.

Dr. W. N. Robertson (Brisbane) spoke of the evolution of treatment from the days of drainage via a tooth socket, and stressed conservatism in dealing with the mucous membrane of the antrum.

Dr. J. Acomb (York) drew attention to the fallacy of antrum puncture as a test of patency of the ostium. Inability to pump fluid into the nose was often due to the trocar becoming buried in swollen mucous membrane.

Dr. Leonard Johnston (Melbourne) had noticed, when in London some years ago, that in cases requiring operation intranasal antrostomy was the operation of choice; and, as far as he knew, the results were satisfactory. He had followed this practice in Melbourne for some years, but found that his results were very poor, so that he now performed the radical operation.

Dr. Clive Eadie (Melbourne) believed that when the mucous membrane of the antrum was degenerated beyond recovery, it should be removed entirely; and he was very satisfied with the result of this procedure.

Dr. R. E. Buckingham (Orange, New South Wales) suggested that the prevalence of sinusitis was possibly due to food deficiency. Country people in Australia consumed a great deal of white bread and tea, and their diet was deficient in vitamins.

Dr. Munro (Palmerston North, New Zealand) stated that sinusitis was just as common in New Zealand, where they thought that the damp climate was a factor. He had little faith in nasal antrostomy.

Dr. F. Muecke, the President, supported Dr. O'Malley in advising medical treatment only for the acute stages of sinusitis. He considered nasal antrostomy most unsatisfactory, first, because of the difficulty in maintaining a permanent opening, secondly, because of the inability to inspect the mucous membrane, and, thirdly, because of the possibility of creating a valve-like action by pushing a piece of bone into the antrum. The Caldwell-Luc operation was the only procedure worth considering and it should never have been called a radical operation. In actual fact there was less damage to the turbinates than in other operations. He had the utmost respect for the turbinates and practically never interfered with them surgically.

Sinusitis in Children.

Dr. G. C. Scantlebury (Melbourne) read a paper on sinusitis in children. He pointed out that the ethmoidal cells and the maxillary antrum were definite structures at birth, and that by the fifth or sixth year all the sinuses were large enough to be the seat of acute or chronic disease. He dealt with chronic and subacute sinusitis only. The causes of sinusitis were deficient hygiene, defective feeding, bad climatic conditions, allergic state, exposure to local infections, nasal abnormalities and hypertrophied tonsils and adenoids. Dr. Scantlebury discussed each of these causes. He said that he placed hypertrophy of the tonsils and adenoids last, not because it was necessarily the least important, but because it was the one about which there was probably some difference of opinion. In most text books it was placed as the most important cause, but he had long been of the opinion that the possibility of its being an effect should be kept in mind. Lymphoid tissue was firmly believed to have a protecting effect in that it dealt with infection as the first line of defence. If it became grossly enlarged and chronically infected, it could be considered that it was losing in the fight and had become a factor on the other side by causing obstruction and by acting as a sponge to hold infection. He agreed with Cantor in not advising removal of tonsils and adenoids until careful consideration had made it appear necessary. The mere presence of tonsils and adenoids was not enough; it was necessary to be certain that they were causing obstruction or were septic.

Dr. Scantlebury said that in general practice there were three types of chronic sinusitis found in children: (i) suppurative, (ii) hyperplastic, (iii) mixed suppurative and hyperplastic. There was probably never any infection of the sinuses without hyperplasia, and on the degree of hyperplasia depended to a very large extent the operative measure necessary and the prognosis. X rays were most valuable in determining the degree of hyperplasia. Dr. Scantlebury showed X ray films illustrating the various appearances. He then mentioned the sequelæ: chronic bronchitis and bronchiectasis, gastritis and other bowel conditions. He also said that arthritis, though perhaps not often in children, was commonly attributed to sinusitis. Retrobulbar neuritis, psychosis and grosser brain and pituitary lesions had been demonstrated; and if sinusitis was unchecked, it might develop into chronic sinusitis with polypi in the adult or atrophic rhinitis.

In regard to treatment, in children under five years of age the treatment was mostly medical; intranasal surgery had not been successful in his hands in children under five. He laid stress on the question of diet and attention to climatic conditions. He discussed local treatment under the headings of applications, antrum puncture and lavage, and operation. He described his method of opening the antrum, and in this regard emphasized the necessity for not injuring the inferior turbinate bone and for being certain that the opening into the antrum was not ragged. Radical operation on the antrum was very rarely carried out, and then only on children with gross polypi. In suppurative cases with evidence of spread from the ethmoid or frontal sinuses an external operation might be necessary.

Nasal Allergy.

Dr. H. M. Jay (Adelaide) read a paper on nasal allergy. He said that for the correct diagnosis of allergy from nasal symptoms considerable vigilance was necessary and the possibility of its presence should never be overlooked. Three types of history (at least) should be recognized. When a patient came saying: "I have many colds; in fact, I am rarely without one", the accuracy of this statement should be closely examined before it was accepted. In nine cases out of ten it would be found that these "colds" were the sneezing attacks of hay fever. Another would say: "I suffer dreadfully from catarrh". The third type was the most difficult of recognition, for very many patients came complaining of nasal blocking and nothing more. Unless it was remembered that the early morning and the late evening were the times of election for the manifestations of allergic phenomena in the nose, the sight of apparently normal nasal cavities during the day would only arouse suspicions of neurasthenia. Once rhinologists began to think "allergically", a little further questioning along the lines of family history would frequently furnish additional confirmatory evidence. Association of itching in the eyes, ears and palate would give additional confirmation in a case suspected of being allergic in origin, and the extreme irritability of the nasal mucosa in allergic patients was of considerable diagnostic value.

Dr. Jay mentioned the difficulty that existed in distinguishing between a chronic catarrhal affection with polyposis and changes in the deeper mucosal layers, and an allergic affection without any infection. It was possible to have: (i) polyposis due to allergy, (ii) polyposis due to infection, (iii) polyposis with both allergy and infection. The presence or absence of an abnormal type of nasal secretion—mucous pus or pus—was a rough test for determining the presence or absence of infection. As a rule one might receive the necessary guidance from the appearance of the mucosa in drawing conclusions, or (in those cases in which operation was rendered necessary by the character or extent of the morbid changes) from the reaction of the tissues to operation. If an allergic patient had a waterlogged nasal mucosa, he also had a waterlogged sinus mucosa, and an X ray examination might reveal it as such, though a second picture taken twenty-four hours later might show a normal mucosa. As to treatment, he believed that a recognition of the offending protein, when possible, and desensitization were their sheet anchor. Local treatment would benefit a large number of those who suffered to a slight extent, but even in them the effect was often temporary. They should go further and seek the cause. Ultimately they had to answer the questions: "What is the nature of this allergic tendency?" "What are the inheritable characteristics determining its existence, and how may they be controlled?" "Why does the increased capillary permeability arise?"—a series of problems for the biochemist.

Failure to obtain a positive skin reaction to foreign proteins left a choice of two methods of attack—general and local. Faulty diet might be a contributing factor; but when one considered, first, the inherited tendency to allergy, and, secondly, the early age at which this tendency might make itself manifest (it had been proved to be present a few days after birth), one realized that the root of the trouble must go far deeper than this, though it was not impossible that certain types of food might help to rectify an inherited error in body chemistry. Thyreoid, mineral acid *et cetera* succeeded in isolated and selected cases.

He advised against septal resection unless the septal deformity was very considerable or the septum itself very thick. Enlargements of the turbinates might call for operation if they gave rise to serious obstruction, but these measures in themselves did not do more than prepare the soil for more lasting forms of treatment. In certain types of mucosal change—those characterized by extreme

pallor—surgery of any nature was apt to be disastrous and should be avoided at all costs. Large polypi might need removal, and more extensive operations were indicated in the presence of superimposed infection. For supplementary treatment he always employed zinc ionization and had found it to be a very valuable therapeutic agent. Should it fail, he sent the patient to the radiologist for treatment—not with invariable success, but often with very gratifying results.

In the treatment of asthma he was constantly having patients referred to him together with X ray films demonstrating mucosal swelling, with the statement that the patient required a radical operation on the sinuses in order to bring about a cure of the asthma. He believed that, in the presence of infection, operation must be undertaken; in its absence he refused to be talked into what he believed to be a surgical futility.

Dr. Ivan Maxwell (Melbourne) outlined his routine in the investigation of allergy. Of one thousand patients tested between 1923 and 1929 some 60% gave positive reaction to skin testing. Of a hundred recent unselected cases over 90% gave a reaction. This was explained by the fact that intradermal tests detected many otherwise obscure cases. In addition, previously unsuspected allergens were constantly being added to the routine list.

The Treatment of Chronic Suppurative Otitis Media.

Dr. L. Graham Brown (London) opened a discussion on the treatment of chronic suppurative *otitis media*. He said that it was the first duty of otologists to emphasize continuously the methods of prevention of chronic middle ear suppuration. These consisted in the proper care and treatment of the acute stage and, in those cases tending to become chronic, searching for and dealing with a cause in the nose or naso-pharynx, and possibly in the mastoid itself. The possibility of the existence of a latent mastoiditis, especially in young children, was not always appreciated. Here efficient radiograms were of great value. He said that any case of acute *otitis media* that did not resolve under appropriate treatment after the normal period of ten to fourteen days should be viewed with suspicion and should be regarded as a possible case of latent mastoiditis.

The aim of treatment was to get rid of the infective focus that was keeping up the discharge, and at the same time to attempt to preserve whatever hearing remained. Unfortunately these two objects tended to conflict, especially when surgical methods of treatment had to be employed. Hence the desire to employ conservative methods as much as possible. Conservative methods were legion, and included cleansing solutions, medicated drops, powders, ionization and so forth. It was difficult to assess the curative value of any of them; repair of the lesion occurred as a result of the vitality of the living tissue. Dr. Graham Brown was sceptical enough to disbelieve in their curative value *per se*; he considered them to be useful factors in providing the best possible condition for promoting drainage and to some extent aeration of the lesion. The fact remained that in 70% to 75% of cases of chronic suppuration treated carefully by one of these methods cure resulted. They should not be content with any one particular form of treatment of this kind, but should ring the changes as was done in most kinds of empirical treatment. The treatment that Dr. Graham Brown preferred was the instillation of hydrogen peroxide drops into the meatus, followed by syringing with boracic acid solution; subsequently he instilled drops of rectified spirits of wine or on occasions he applied boracic acid powder with 1% iodine. In a large number of cases failure had to be admitted. Then minor operative measures might be used. It was estimated that 25% to 30% of patients required some form of operative treatment. In accordance with the policy of proceeding on conservative lines, minor operative measures were first employed in the hope of promoting better drainage and allowing access of the antiseptics to the diseased areas. These procedures consisted in incision of the tympanic membrane, when the existing perforation was small and the membrane reddened, thus indicating the retention of pus; the removal of polypi or granulations; very occasionally the curetting of a fistulous track into the meatus; or even in some cases ossiculectomy. The results of this treatment were on the whole satisfactory, a cure being effected in about 5% of such cases.

Dr. Graham Brown said that in regard to major operative measures, the correct procedure had to be determined in the 20% of all cases that required an operation on the mastoid bone. The preservation of the hearing function demanded as little interference as possible with the membranous meatus and the contents of the middle ear. The Schwartze operation best fulfilled this purpose, but its indications were unfortunately limited, and it would serve only in those cases of chronic suppuration in which the attic and particularly its outer wall were unaffected. When the attic was affected the simple mastoidectomy had to be extended to expose the aditus and attic regions. This operation was known as the conservative radical, the antro-epitympanic or transantral attico-tympanotomy. By it most of the contents of the middle ear cavity could be exposed to direct view and lesions such as diseased ossicles, granulations and necrosed bone could be removed. Proceeding further, one might perform the radical mastoid operation by removing the whole of the outer attic wall, the remains of the tympanic membrane and ossicles and the remaining contents of the middle ear cavity, respecting only the lining of the inner tympanic wall and hoping later for epidermization of the resulting cavity. Thus when the indications were not precise it was possible to proceed conservatively, extending the operation further and further in successive steps if it was thought that necessity arose as the extent of the lesion was viewed.

Dr. Graham Brown then discussed the indications of operation in detail under four headings: (i) general indications, (ii) early chronic suppuration, (iii) attic disease, (iv) persistent suppuration. He said that the number of cases of persistent suppuration would be considerably diminished if attention was paid to certain points that he advocated, such as the use of a curved skin-flap incision, as little interference as possible with the membranous meatus and a minimum of interference with the wound during the healing stages.

Dr. R. S. Godsall (Sydney) confined his remarks to cases in which the otorrhœa was of not less than twelve months' duration. He considered that only cases of posterior and marginal perforation with offensive discharge were under discussion. He would not persist with conservative treatment for more than three months, and in this respect he favoured zinc ionization or the use of iodine powder. He asked what was the definition of a "cured case". There was always the bugbear of recurrence of discharge with upper respiratory infections. He would not perform ossiculectomy. He did not favour the attico-antrostomy operation because he felt it was impossible to avoid injury to the malleus and incus and their articulation. A percentage of moist ears after the radical mastoid operation were due to incomplete removal of the outer attic wall or to inability to remove deeply situated peri-tubal cells. For many years he had been opposed to the cutting of a meatal flap and he had found no reason to depart from this procedure after several further years' experience.

Dr. H. J. Gray (Perth) said that cases of otorrhœa following acute *otitis media* of more than two weeks' duration should be referred to an otologist. He agreed that swimming was dangerous to people not only with chronic suppurative otitis, but also when a dry perforation was present. Rubber plugs in the ears were useless. Of conservative measures he thought that it was the efficient cleansing which counted, and found iodine powder or spirit drops the most useful antiseptics. Some failures were explained by inability to get beyond the area of osteitis. His aims of treatment were: (i) to make the ear safe, (ii) to preserve the hearing, and (iii) to make the ear dry, in that order. He concluded by pointing out his own geographical difficulties in that patients travelled hundreds of miles for operation and could not be returned in a condition requiring intricate after-care by general practitioners.

Dr. J. Acomb (York) emphasized the importance of prophylaxis. The foundation for chronic suppurative otitis was usually laid in early life, and education of the public and of students was essential so that the pathological process might be arrested at this stage. In chronic cases he was often obliged to continue conservative treatment for some time owing to shortage of hospital beds, and he favoured "Dimol" powder, which was more stable than iodine powder. Concerning operations, he preferred to advise two or more conservative operations with preservation of hearing rather than one initial radical operation with inevitable loss of hearing function. He favoured a similar conservative operation to that of Dr. Brown, and was aided by magnification with Bishop Harman's binocular loupe. He avoided a meatal flap by filling the cavity with a temporal muscle flap or more recently a periosteal flap.

Dr. H. M. Jay (Adelaide) considered that the amount of retention of cochlear function was a guide to choosing between conservative and radical operation.

Dr. A. B. K. Watkins (Newcastle, New South Wales) stressed prophylaxis. He operated on all patients with otorrhœa after four to six weeks, provided the nasopharynx had been investigated in that period. Following scarlet fever he operated about two weeks earlier.

Dr. J. F. O'Malley (London) discussed the function of the Eustachian tube and pointed out the difficulties of drainage and ventilation of infected mastoid cells. He was inclined to do very few radical mastoid operations.

Dr. Douglas Guthrie (Edinburgh) said that the need for such a discussion was really a confession of failure. Efforts should be concentrated upon the more prompt and efficient treatment of acute otitis and the prevention of chronicity. The radical mastoid operation ought to be one of the rarest events in otological practice.

Dr. J. H. Shaw (Melbourne) noted that Dr. Graham Brown removed "all diseased cells" and stated that he preferred to remove all cells because of the possibility of post-operative infection of any remaining cells. He thought that iodine powder had revolutionized the treatment of otitis, but advised that it should be used only by the specialist.

Dr. Hugh Mitchell (Melbourne) considered that the radical mastoid operation should not be done except when intracranial complications occurred. Why were radical mastoid operations so common in England and so uncommon in Australia? Probably diet was a potent factor, for he had noticed that otitis in children from industrial centres often cleared up spontaneously after a week in hospital, where they received fresh vegetables *et cetera*.

Dr. F. Muecke, the President, felt that more emphasis should be laid on prevention. In his long experience at the London Hospital he had found that inspection of the London County Council school children and attention to naso-pharyngeal disease had enormously decreased the number of ear cases. He had tried all the new conservative measures and always came back to the use of spirit drops. He agreed with Dr. Shaw that "all the cells" must be removed, and favoured a periosteal flap when operating.

Dr. L. Graham Brown, in reply to Dr. Godsall, stated that the ossicles were not so delicate if one was careful. The advantage of the attico-antrostomy operation was the preservation of hearing. The ideal condition for this operation was attic suppuration, and the operation could also be applied to small cholesteatomata. Not all cases became absolutely dry; there might be just a little moisture, of small inconvenience to the patient. The operation had the added advantage of protection of the inner tympanic wall and a certain amount of preservation of elasticity of tissues. His maxim was "safety first, then preservation of hearing".

Ultra-Violet Irradiation in Tuberculous Laryngitis.

Dr. Thomas Millar (Melbourne) demonstrated his method of treating tuberculous laryngitis with ultra-violet irradiation. He said that a Kromayer lamp with a curved quartz glass applicator was employed. Important points in the technique were: (i) complete anæsthesia of the pharynx and larynx for each treatment, (ii) hooking the epiglottis forwards with the tip of the quartz applicator, (iii) direct observation of the area irradiated by means of a small post-nasal mirror. Treatment should be confined to cases pronounced non-progressive by the physician, and the patient should have no evening rise in temperature. Dr. Millar gave a description of two cases in which tuberculous lesions had healed with scar tissue whilst under the treatment.

Section of Pathology and Bacteriology.

President: Professor A. Murray Drennan, M.D., F.R.C.P. (Edinburgh).

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Honorary Secretaries: C. H. Kellaway, M.C., M.D., M.S., F.R.C.P. (Melbourne); Professor H. A. Woodruff, M.R.C.S., L.R.C.P. (Melbourne).

Calcification.

Dr. F. S. Hansman (Sydney) opened a discussion on the problem of calcification. He gave a short account of the histogenesis of bone and laid emphasis on the anatomical features of the diaphysis, epiphyses, and the periosteum, and on the function of the hypertrophic cartilage cells, the osteoblasts and the osteoclasts. He emphasized the importance of the physico-chemical structure and the active part taken in calcification by the matrix of bone. He considered the composition of the bone salts and illustrated the various formulæ of apatite salts. Against the results obtained by pure analysis Dr. Hansman dealt with the evidence of a more biological nature indicating that calcium carbonate and calcium phosphate were separately precipitated, and he reached the conclusion that further work was required to settle this fundamental problem. In discussing the blood in relation to calcification, Dr. Hansman spoke of recent work concerned with the form in which calcium existed in the serum, and the conclusion of McLean and Hastings that the simplest conception was that the calcium existed as calcium proteinate which was ionized as a weak salt was accepted, as were also the conclusions of Fischer and Hooker that serum must be regarded, not as a watery solution of proteins, lipoids, electrolytes *et cetera* in water, but as a solution of inverse type—of water in protein. The forms in which phosphate was present were also briefly noted, and the significance of the chemistry of the calcium and phosphorus in the serum to the problem of the deposition of bone salts was indicated.

The mechanism of calcification in the light of Robison's work was next reviewed, and the conception of Robison that an enzymic complex (analogous to the yeast fermentation or the enzymic system in muscular contraction) was responsible for the process of calcification was considered in some detail. The principal known components of this enzymic system were the osteoblast, the hypertrophic cartilage cell, the organic matrix, the bone phosphatase, the secondary calcifying mechanism, vitamin *D*, and the constituents of the serum. The relative part played by each was discussed. The clinical value of estimating the amount of bone phosphatase in the serum in cases of bone dystrophy was mentioned.

The recent work on the *modus operandi* of vitamin *D* was reviewed, and the interdependence of vitamin *D* and the absolute and relative amounts of calcium and phosphorus in the diet received attention. It was shown that the importance of vitamin *D*, calcium and phosphorus was a species variant, and the relative importance of these three substances to rats, ovines, bovines, equines, dogs, goats and humans was illustrated.

The part played by the secretions of the endocrine glands was indicated, and emphasis was laid on the recent work of Shelling and of Selye on the manner in which injection of parathormone acted in moderate and excessive doses. The clinically important problem of the actual requirements of calcium and phosphorus for normal calcification in the human was then taken up, and Dr. Hansman showed that from various means of calculation, including his own balance experiments on children and the actual amount of calcium in the diet of normal Australian children, 0·5 gramme of calcium *per diem* was apparently an ample maximum for the calcium requirement. The difficulty of ascertaining an analogous value for phosphorus was emphasized.

Dr. Hansman concluded by considering certain general and philosophical aspects of the problem, such as the factors that determined the limitation of bone growth, the shape of bones, their strength and internal architecture.

Professor P. MacCallum (Melbourne) said that in addition to the important mechanism of calcium liberation by phosphatase, the chemical and physical relationship of the calcium deposited to the medium or matrix in which it was deposited, was of importance, and suggested that specific physio-chemical information about the various mucinous bases of the matrices was needed. The behaviour of calcium deposition in relation to the supply of phosphorus and certain features of the vitamin and parathormone suggested that such deposition occurred in a zone comparable with that determined by similar conditions in colloidal states. Calcium deposition in dead tissue and its relationship to blood supply were important. The work of Adamson and Smith on the condition of calcium deposition from saliva and its bearing on the formation of concretions were of considerable interest. Dadswell had analysed the phosphorus content of Australian grain and vegetables, and had shown that there was a low phosphate content. This was important in relation to dietetic requirements.

Dr. Edgar King (Melbourne) discussed the development of calcification in those conditions in which certain epithelial tissues, for example, bladder wall or part of the intestine, were implanted into the anterior abdominal wall of animals. Lantern slides from photomicrographs of actual examples were shown. Phosphatase was present in the fluid obtained from the cysts lined by the transplanted epithelium.

Dr. R. A. Willis (Melbourne) mentioned experiments which had been carried out in 1870, in which the whole renal pedicle was ligated, with a resultant deposition of bone around the pelvis of the degenerated kidney. He had repeated these experiments and had confirmed the results of the German workers. The metaplasia of bone following the death of the tissue was important.

Dr. R. D. Wright (Melbourne) referred to the nature of the compound formed in bone between the protein matrix and the calcium phosphate. From the observation that calcification was always associated with a mucinous (glyco-protein) compound, it might be argued that there was a compound form with a linkage of the calcium or phosphate to the hexose, forming a colloidal solid. This was borne out by the observation that in sequestra with deproteinization of the bone the calcium separated as crystals with the optical axes in the longitudinal axis of the bone. This orientation of the crystals was probably the basis of the increased opacity of sequestra to X rays and might explain the delay in the demonstration of dead bone by such means in cases of osteomyelitis.

Dr. J. V. Duhig (Brisbane) said that he had submitted calcified arteries (the abdominal aorta and the coronary arteries) to chemical investigation. The phosphates and carbons of calcium were always present in proportions identical with those found in bone. A calcified vessel was really a bone. The presence of calcification in the costal cartilages was not dependent on old age, but was probably associated with some basic vascular lesion.

The Pathology of Osseous Tissue.

Professor A. M. Drennan (Edinburgh) opened a discussion on the pathology of osseous tissue. He began by pointing out that the pathology of osseous tissue differed from that of any other connective tissue only in that it was hard, owing to the presence of calcium, and therefore any factor which affected calcium metabolism would affect bone. Calcification was in a sense an afterthought; an osteoid matrix was required before the calcium could be laid down, and the calcium could be removed from and redeposited in the original matrix. As regards osteogenesis, Professor Drennan remarked that it was still the subject of controversy; clinicians had embraced the theory of Leriche and Policard, displacing the osteoblast from its previous importance; but it would seem that between this extreme and the older view there was a middle way. The osteoblast was apparently a specialized connective tissue cell and produced an osteoid matrix, though it was doubtful whether it took any part in the deposition of calcium. This seemed to be due more probably to the physical condition of the matrix *plus* the action of phosphatase enzymes in splitting off the calcium and phosphorus ions from their original combinations, thus favouring their deposition. This action was reversible, and attention should also be given to the effect of the phosphorus concentration pH on phosphatase, and also of the degree of available blood supply, as altered by conditions of vascularity or anæmia. Professor Drennan pointed out that the matrix of the bone was only secondarily affected, as when loss of calcium and therefore of rigidity imposed new stresses on the cells of the matrix, thus producing activity of these cells, with formation of new matrix tissue. One of the chief difficulties in the way of accepting the specific rôle of the osteoblast lay in the formation of heterotopic bone. Where such was formed in the region of existing bone, as after trauma, it was easy to understand how it could be possible for the osteoblasts to migrate and proliferate, but no such explanation fitted the rare cases of bone formation in other sites, such as a calcified aorta. Perhaps the fibroblast here became less specific in function and formed a suitable matrix in which calcium was laid down.

Professor Drennan then went on to describe the various forms of bony lesion. Inflammatory lesions could be briefly passed over; the chief difficulty for the tissues to solve in healing was the removal of the devitalized parts, on account of their hardness. Atrophies and hyperplasias, being slow changes, also called for little comment. He dealt in more detail with *osteitis fibrosa* and *osteitis deformans*. The former was clearly related to the overactivity of the parathyreoids; he could corroborate the findings of others that there was no preponderant type of parathyreoid change as regards the cellular structure; this paralleled the findings in thyreoid disease. The bone change was that of over-production of matrix, with removal of calcium, a process that was intermittent and which could be imitated experimentally. In other conditions leading to loss of calcium from bone it was not known what the effect was upon the parathyreoid. *Osteitis deformans* needed no detailed description, but the underlying causes were obscure. No constant parathyreoid change had been found, no abnormal variations of the blood

phosphorus or calcium occurred, though the phosphatase might be increased, and removal of the parathyreoids was without effect on the disease. Thus no obvious endocrine or biochemical upset had been demonstrated. Professor Drennan related in detail the clinical and autopsy findings in a case of *osteitis deformans* illustrating these points. Other bone conditions were described in the literature; these often involved the joints, opening up a field too great to be traversed in the present discussion. Of special interest were the local atrophies, cysts and hyperplasias; their ætiology was obscure.

Lastly, Professor Drennan dealt with the tumours of bone. He remarked on the extreme difficulty experienced by every pathologist in identifying the primary site of the secondary growths of bone. The different behaviour of these tumours in their environment was also notable; some caused absorption of bone, others gave rise to little disturbance. One very interesting form of reaction was that seen sometimes in connexion with the meningiomata of the skull, which might so stimulate the bone tissue in contact with them as to give rise to hyperplastic change, causing even a hard nodule of bone to appear on the surface of the skull overlying the tumour below. He gave details of one case in which a meningioma of the basisphenoid which had penetrated the ethmoid cells was associated with a great thickening of the cranial bones elsewhere.

Professor Drennan showed that the giant-cell tumour of bone was falsely called "benign"; whether the type of cell changed or whether its osteogenic character was obscured, the fact remained that it was potentially malignant. The myelomata should, strictly speaking, be omitted, as they arose from the marrow, but their involvement of bone made them important, questions of compensation being sometimes involved. In conclusion, Professor Drennan referred to the present obscurity of the curious distribution of bony changes in the various forms of endocrine and inherited dystrophy. The urge of bone to form after its pattern species had been demonstrated by Dr. Honor Fell, and when it was better understood how this process came about, the pathology of osseous tissue would become clearer.

Professor P. MacCallum (Melbourne) said that the behaviour of bony tissues in pathological conditions could be better understood if the calcium content was regarded as incidental and the reactions as those of specialized connective tissue with fluctuations according to circumstances in the amount and condition of the intercellular matrix, its vascularity and its cellular content. It would therefore vary from osseous to fibro-osteoid, to fibroid, to fibro-mucinous, to myxomatous, or to a cellular tissue, mainly osteoclastic, which the uninitiated would never suspect of bone relationship. There would be corresponding variations in the amount, disposition, and condition of its calcium content in accordance with environmental conditions. The quality of bony rigidity was dependent on the nature of the matrix as well as on that of the calcium impregnation. Mere density of calcium deposit was no guarantee of strength, as was evident in such conditions as "marble bones". Bone was not a satisfactory skeletal material unless calcium salts were present, not only in sufficient amount, but in the requisite form and relation to the matrix. The metaplastic range of the elements of bone tissue, as manifested in inflammatory dystrophic and neoplastic conditions, was of particular interest when contrasted with that usual fixity of cellular form and function which also made the occurrence of heterotopic bones remarkable. The observations of Harris and others on lines of arrested growth in childhood and related studies in disease processes in growing bones emphasized the interplay of environmental practice with the genetic determination of growth pattern. Though the vascular hypothesis of Leriche and Policard was not supported, it should stimulate inquiry into the vascular accompaniments of bone conditions. Pathologically it was a restatement of certain facts without obvious advantages. The analyses of the effect of internal secretions, vitamins and variations in the supply of essential salts in the different stages of bone development were opening up the way to a better understanding of bone pathology.

Dr. Keith Inglis (Sydney) asked whether the destruction of osseous tissue was due to osteoclasts alone or to some other factor. He referred to heterotopic bone and said that he had seen bone formation in the bronchus, the eyeball and the liver.

Dr. Edgar King (Melbourne) discussed a number of specific examples of metaplasia in connective tissue, especially Charcot's disease, Preiser's disease and Kümmell's disease, and illustrated his remarks with lantern slides. He demonstrated the presence of bone marrow tissue in osteogenic sarcomata and thought that his observations supported those of Borst. He discussed the possible interpretation of these observations and referred to the evidence for considering that the bone marrow was actually formed in the tumour.

Dr. R. A. Willis (Melbourne) referred to the significance of osseous metaplasia in connective tissues. This occurred in scars, in chronic inflammatory tissue, in the walls of diseased arteries, occasionally in the stroma of carcinomatous growths, and in a variety of other situations. This capacity of fibroblastic tissue to change into obvious tissue under the stress of certain pathological conditions was the most striking instance of metaplasia and was of great significance in pathology generally, and in the pathology of bone in particular. Its general significance was that it showed that the tissues of the adult had not altogether lost the plasticity which was so characteristic of the early stages of development of the embryo. Experimental embryology had shown that the tissues of the pregastrular embryo were almost completely plastic; that was to say, their prospective lines of differentiation were not irrevocably fixed, for tissue from almost any part of the embryo was able, given an appropriate environment, to differentiate into almost any kind of adult tissue. During gastrulation the tissues commenced to lose their plasticity in a progressive way, so that the embryo became a mosaic of smaller and smaller parts, the fate of each of which was now fixed within relatively narrow limits. The occurrence of metaplasia, however, proved that even in the adult this fixation of tissues was not absolute and complete; and it would be a highly important general problem for future pathological research to determine the limit within which each variety of tissue was capable of changing its type in response to environmental changes. The phenomena of inflammation, tissue regeneration and repair, hyperplasia and neoplasia, all came into consideration. The special significance of bony metaplasia, of connective tissues, was, of course, in the pathology of bone. If fibroblastic tissue was able to become bone, then clearly this change might operate in some or all of the many diseases of bones in which proliferation occurred. In the repair of fractures, in chronic inflammatory diseases with bone sclerosis, and in osteoplasia, associated with metastatic carcinomata or other tumours, osseous metaplasia of fibroblastic tissues might be in progress side by side with osteoblastic proliferation. It became essential to ask whether there was any real difference between a fibroblast and an osteoblast. An osteoblast might be the same cell as a fibroblast, but under a different set of external conditions. The occurrence of bony metaplasia of connective tissue on the one hand, and the ready development of abundant connective tissues in various rarefying diseases of bone on the other hand, at least suggested that in bone disease reversible osteoblast-fibroblast transformations might be of general importance.

Dr. J. V. Duhig (Brisbane) said that osteogenic sarcoma was associated with *osteitis deformans* in about 15% of cases.

Dr. R. D. Wright (Melbourne) referred to the work of Leriche and Policard. He said that in a limb with an arteriovenous aneurysm there was no X ray evidence of decalcification. Tuberculosis, which was an avascular disease, caused decalcification, whereas syphilis, a vascular reaction, caused an increase in bone. The changes in the vessels might be a result of the bony changes and not the cause of them.

Professor Drennan, in reply, said that he did not think osteoclasts were necessary for the absorption of bone. Osteogenic sarcoma was associated in some cases with *osteitis deformans* and he had seen it in association with *osteitis fibrosa cystica*.

Leuchæmic Infiltrations.

Professor J. B. Cleland (Adelaide) read a paper on leuchæmic infiltrations. He gave a short description of four cases in which presumed leuchæmic infiltrations had taken place in unusual situations or to an exceptional degree. In none had a blood count been carried out. The first was that of a male dement, aged fifty-seven years, who for thirty-two years had been an inmate of the Parkside Mental Hospital; he died suddenly from acute heart failure attributed to extensive cellular infiltration of the cardiac muscle; there was also a similar infiltration in the kidneys. The second patient was another male, aged forty-two years, from the same institution, who had suffered from *dementia præcox*; after an influenza-like illness he became very anæmic and died; the cardiac muscle showed myelocytic infiltration, which was also present to some extent in the liver. The third case was that of a schoolboy, who died after a fit following on a short and vague illness; the brain showed softened foci with hæmorrhages containing vast numbers of cells of the myelocytic series, and similar cells infiltrated the kidneys and liver. The fourth case was in a child of eighteen months, who died with a sloughing ulceration of the pharynx and in whom the leuchæmic infiltration of the kidneys and pancreas widely separated the specific structures of these organs.

After raising the questions as to whether these and similar infiltrations, sometimes diffuse, sometimes nodular, in various organs and tissues, all represented one process or several different entities, and whether there was a clear-cut means of differentiating in all cases betwen luchæmic infiltrations, lymphosarcomatous infiltrations, and infiltrations met with in some cases of acute Hodgkin's disease, Professor Cleland gave short definitions of these three conditions, based on various authorities. He followed this by a review of the findings in 3,500 South Australian autopsies, which included: ordinary myeloid leuchæmia, 9 cases; myeloblastic leuchæmia, 4; ordinary lymphatic leuchæmia, 7; lymphatic leuchæmia with extensive infiltrations, 3; pseudoleuchæmia (aleuchæmic leuchæmia), 3; leuchæmic infiltrations found but blood counts not made, 4; atypical cases, perhaps leuchæmias, 3; lymphosarcomata, 6; multiple myelomata, 2; chloroma (?) (no increase of white cells in the blood), 1; ordinary Hodgkin's disease, 7; acute Hodgkin's disease with multinucleated cells, 6; Hodgkin's disease with sarcoma (reticulo-endothelioma), 3.

Amongst the examples given, the following were of more particular interest: (i) Lymphatic leuchæmia in a male, aged sixty-six years, following on a sore on the back of the hand and an enlarged epitrochlear gland, infiltrations at the sites of the injection of soamin and in the scar of a surgical incision. (ii) Lymphatic leuchæmia in a male, aged thirty-eight years, with nodules in the kidneys, the liver and pericardium, plaques on the ribs, and a mass pressing on the lower part of the spinal cord. (iii) Lymphatic leuchæmia in a male, aged fifty-one years, with tumour-like masses around the abdominal aorta and around both kidneys, in the mediastinum, and in the left scrotal sac. (iv) Pseudoleuchæmia (aleuchæmic leuchæmia) in a girl, aged thirteen and a half years, with profound anæmia and a white cell count of 3,700, with no abnormal cells; the liver was stuffed with large numbers of rounded cells. (v) Pseudoleuchæmia in a boy, aged thirteen years, with a white cell count from 6,000 to 14,000 and normal differential count; the spleen weighed 27 ounces; there were enlarged glands along the abdominal aorta, extending into the groins, and microscopically extensive infiltration with cells like large lymphocytes of the liver, kidneys and testis, with some infiltration of the heart muscle. Four examples were given of what were considered to be cases of lymphosarcoma; the spleen in these cases was not appreciably enlarged. Five examples were given of Hodgkin's disease, showing infiltrations and presenting the characteristic multinucleated cells; these cases were either acute or ended acutely. In one, a male, aged twenty-six years, the patient had been treated for seven years with deep X ray therapy; in addition to enlarged glands there were miliary spread in one lung and umbilicated deposits up to three and a quarter inches in diameter in the liver and two inches in the spleen. A male, aged twenty-one years, with a leucocyte count falling from 6,000 to 1,600 and a polymorphonuclear leucopenia, had large soft Hodgkin's glands along the abdominal aorta and into the left groin, and an enlarged spleen of 40 ounces, showing diffuse Hodgkin's infiltration. Three examples were given of the sarcomatous type of Hodgkin's disease.

In the discussion it was pointed out that the infiltrations in all this group of diseases differed from secondary malignant deposits in the more diffuse type of infiltration, so that some of the original elements of the part persisted for long. Whilst the majority of patients with leuchæmia died from secondary anæmia, gradual asthenia, and intercurrent infections, the examples given showed that death might result from leuchæmic infiltration of such an organ as the heart before more generalized symptoms of the disease had progressed far. It was also suggested that the infiltration of such organs as the kidneys and even the pancreas might sometimes be such as to interfere seriously with the functions of these parts. Collections of leuchæmic cells in the brain were often the result of hæmorrhages in the neighbourhood of softened areas.

Professor Cleland said that a study of a series of cases such as this showed the difficulty in deciding in some instances under which category to place a particular case. The spleen did not seem to be necessarily enlarged in early or aberrant cases of leuchæmia. The presence of the characteristic multinucleated cells, even though in small numbers, helped to justify the inclusion of a case under Hodgkin's disease, though otherwise the microscopic appearances might suggest lymphosarcoma.

The Neural Components of Teratomata.

Dr. R. A. Willis (Melbourne) read a paper on the neural components of teratomata. He said that nearly all teratomata contained nervous tissues in great variety. He had examined 22 teratomata by the serial slab method. In 18 of the 22 teratomata neural tissues had been identified with certainty. This figure was probably an under-estimate. In three testicular tumours in which no neural tissues were identified, there were rapidly growing elements, the specific identification of which was not possible, and which might have included anaplastic neuro-epithelial tissue. Discussing the finding of nervous tissues in so-called dermoid cysts of the ovary, Dr. Willis said that there was no justification for the attempt to distinguish between teratomata and dermoid cysts. A dermoid cyst was merely a teratoma, one of the skin-lined cavities of which had grown to a relatively large size. Dr. Willis discussed the varieties of neural tissues found in teratomata. Immature central nervous tissues were often plentiful in actively growing malignant teratomata. The least differentiated of these took the form of neuro-epithelial tubules, networks or papillary formations. Some of these were difficult to distinguish from immature glandular structures. Sections of neuro-epithelial tubules in teratomata might closely resemble those of the neural tube of the early embryo; and there was clear structural evidence that, like the normal neural tube, teratomatous neuro-epithelium arose by infolding or delamination from undifferentiated epithelial surfaces, the remainder of which developed into stratified epithelium of epidermal type. Mature central nervous tissue in teratomata most frequently took the form of large compact masses or smaller scattered patches of neuroglial tissue, with or without ependyma-lined cavities. The neuroglial feltwork was devoid of nerve cells and nerve fibres. Occasionally groups of well developed nerve cells were present. Degenerative and senile changes, similar to those seen in the normal nervous system, were often present in teratomatous central nervous tissue. Dr. Willis also described the immature and mature peripheral nervous tissue that might be present in teratomata. He then went on to discuss the possible functional significance of some of the nervous

elements in teratomata. He said that the healthy appearance of many of the nerve cells in the ganglia, and less frequently in the central nervous tissue of teratomata suggested that they might have been capable of functioning. It was therefore pertinent to ask whether the nerves in these tumours might not sometimes effect functional connexions with other tissues and so influence their differentiation and growth in ways comparable with those obtaining in normal ontogeny. The first step in attempting to establish this view would be to demonstrate the presence or effect of nerve endings in muscle fibres and glandular epithelia. This had not yet been done. Dr. Willis concluded by emphasizing that the nervous tissues found in teratomata did not form an organized nervous system. Many writers had claimed to see parts or whole of a brain or spinal cord in teratomata.

Anaerobes in Disease.

Professor H. A. Woodruff (Melbourne) opened a discussion on anaerobes in disease by reading a paper entitled: "Some Toxæmias of Animals due to Anaerobic Organisms". He stated at the outset that the three main groups of human conditions in which anaerobes were of importance were wound infection with gas gangrene, puerperal infection, and toxæmia in intestinal obstruction and peritonitis. The first type presented no particular problem in the present instance. The second group was akin to the first, as it was really a variety of wound infection and was not a sequel of normal labour. These cases were very important, since they were attended with so high a mortality, and effective treatment was so difficult. There was no doubt that when intrauterine manipulation might have introduced bacteria, when the child was dead and retained for some hours *in utero*, trauma of the uterine lining provided a ready access for the organisms, and in these cases antitoxin should be given prophylactically. In certain other abdominal conditions, such as gall-bladder infections, similar infections might occur, but the most interesting group was the third, that associated with intestinal obstruction and peritonitis. Professor Woodruff said that at present there was no agreement as to the pathology of this species of toxæmia. Williams had pointed out in 1928 that the toxæmia strikingly resembled that of gas gangrene, that anaerobes were frequently present in the intestine, and that the conditions present in obstruction were precisely those favourable for their germination. Holt, however, had recently come to the conclusion that the effect of the exotoxin of *Bacillus welchii* was negligible and that the use of *Bacillus welchii* antitoxin was unwarranted. The question could not be considered settled. Professor Woodruff had been particularly interested in certain experimental work in connexion with animal infections and had had some share in initiating it, and therefore brought it forward in the hope that in the light of this knowledge some of the views held on the human infections might be revised.

The first of these infections was "blackleg" in calves. This had no relation to anthrax, and occurred in both sheep and cattle; only the disease in cattle was of interest here. It was confined to certain infected farms, or even certain fields; death was almost invariable, and occurred rapidly, usually before the local lesion, a swelling of the gluteal and lumbar muscles, was noticed. The cause was an anaerobic bacillus. Another anaerobic disease of sheep was "braxy", which had been proved to be due to the *Vibrion septique*. Great care had been necessary to demonstrate this beyond doubt; the animals had to be watched carefully till the diagnosis was certain, and then killed after being made moribund by bleeding, to avoid confusion and contamination. The infection was believed to come by ingestion and to be favoured by the swallowing of cold or frozen food. Vaccination on a large scale had been quite successful.

Then there was "black disease" of sheep, a form of infectious necrotic hepatitis widely prevalent in New South Wales, Victoria and Tasmania. Turner had done most valuable work, following the accepted method of examining only those animals seen during life to be affected, so that the rapid *post mortem* changes might be forestalled. Two factors were involved, liver necrosis associated with fluke migration, and infection with a strain of *Bacillus œdematiens*. Interesting features were the fact that spores of this organism were proved to be present in the livers of sheep on infected land, that these were toxin-free, and that such spores were innocuous when injected free of toxin, could be recovered from the liver after ingestion, and that the disease could be reproduced if at the same time various substances were injected with the spores, thus introducing an accessory factor. These findings had been repeated in rabbits, and the fruit of the work had been seen in the success attending vaccination and antifluke measures in affected districts.

Still another infection was the infectious enterotoxæmia of sheep. The careful work of Bennetts in Western Australia had shown this to be due to *Bacillus ovitoxicus*, which strongly resembled *Bacillus welchii*, and experimental work then demonstrated that the disease could be reproduced only when not only the organism was introduced, but when intestinal stasis was also brought about in the animals. Lamb dysentery was yet another disease of animals due to an organism of the *welchii* group; this bacillus apparently had affinities to *Bacillus welchii* on the one hand and *Bacillus ovitoxicus* on the other.

In conclusion, Professor Woodruff pointed out the crucial and conclusive results obtained from these researches into animal disease. Of particular interest was the proof that there were special conditions necessary to produce actual infection by these various anaerobes. Williams had foreshadowed this in his human researches, pointing out that it required very special conditions for the establishment of *Bacillus welchii* infection in living human tissues. Exact typing of this bacterial group would be necessary also, as shown by the close relation of the above groups found in animal infections. By attention to these points, and not forgetting the possibilities of latent spores in the human subject, prevention of such infections in man might be looked forward to with greater hope.

Professor C. E. Hercus (New Zealand) said that he was glad to see so much attention being paid to comparative pathology at a conference of the British Medical Association. He stressed the parallelism of the problem of human and animal pathology in such diseases as goitre, hydatids, *Brucella* and tuberculous infections. With regard to anaerobic infections of animals, his experience was confined to the infection of entero-toxæmia of lambs, and he did not think that there was likely to be any close parallelism in the mode of infection, except in the importance of accessory factors. He referred to the toxæmias of tetanus and botulinus, which affected both men and animals. Tetanus was more prevalent in certain districts of New Zealand than in others. The importance of catgut as a source of infection was realized, but the organism had not been isolated in every case from the implicated gut. He stressed the importance of the path of the toxin to the central nervous system, and thought that radical revision of the present knowledge might be necessary. There had been 213 fatal cases of tetanus in New Zealand in the last twenty years, and a noticeable fact was the excess of male cases over female cases, in the proportion of four to one. With reference to diseases caused by the *Clostridia*, he stressed the importance of an association of the secondary pyogenic organisms, especially in gas gangrene. With regard to the *Clostridia* infections in animals, blackleg was very prevalent in some parts of New Zealand, and vaccination had proved effective as a prophylactic. True braxy was not found in New Zealand. Black disease was present in New Zealand and considerable important work had been done in the investigation of this disease. In 1929 he had shown that a toxæmia was present in this disease, and he referred to the possible importance of nutritional factors in its ætiology. He did not think that the question of intestinal stasis played an important part. He referred to the experimental work at present being done with regard to the ætiology of this disease.

Dr. G. H. Oxer (Western Australia) stressed the importance of fat body condition as a predisposing cause of these diseases, particularly in relation to blackleg of

calves and black disease of sheep, and somewhat less so in the case of braxy and the infectious entero-toxæmia of sheep. He emphasized the different reasons for the seasonal appearance of these diseases. The importance of diet in relation to infectious entero-toxæmia was stressed. The age incidence of this disease depended on the age of the young susceptible animal at the time of flush growth of pastures in spring or autumn. In at least two of the diseases there was definite field evidence to show the development of flock immunity. The most universally successful method of active prophylactic immunization was by the use of antigens consisting of anaculture (toxoid and bacterial bodies). For economic reasons the use of antitoxic sera as a general prophylactic measure in livestock was not feasible. Active immunization of pregnant ewes with a view to protecting lambs during the first few weeks of life was advocated in view of the transference of antitoxin to the lamb via the colostrum, as demonstrated by Mason, Dalling and Gordon in lamb dysentery in England. He had confirmed this work for entero-toxæmia in Australia.

Dr. C. W. Adey (Melbourne) said that when a toxin from a culture of *Bacillus welchii* was produced, it was tested by intravenous injection into mice; with a relatively large dose the mouse died within two minutes with a convulsive seizure. Death was due, not to the true toxin of the *Bacillus welchii*, but to a pseudotoxin. The true toxin contained an element which was hæmolytic. When a human being was suffering from the effects of the toxin of the *Bacillus welchii*, whether the lesion from which it was absorbed was in an injured limb or in the genital tract, the hæmolytic effect in that human being was obvious. In the patient suffering from acute obstruction of the small intestine there was no such sign of gross destruction of the blood. He put forward these facts as evidence that the true toxin of the *Bacillus welchii* did not as a rule play a major part as a cause of the symptoms observed. The reason for this was difficult to explain, as there seemed to be every bacteriological reason that it should. Numerous workers had observed that the *Bacillus welchii* had proliferated intensely in the contents of the obstructed small intestine. Since these contents must often represent a fairly favourable bacteriological medium, it seemed highly probable that in a large number of instances toxin of significant potency must be produced. One would naturally infer that the toxin of the *Bacillus welchii* was not absorbed through the intact mucosa. The value of the study of infectious enterotoxæmia of sheep was not demonstrated. The toxin of *Bacillus ovitoxicus* was apparently absorbed through the intact mucosa of the sheep's intestine. This disease closely resembled the conditions which occurred in intestinal obstruction in man, and it was reasonable to assume that the toxin of *Bacillus welchii* might be absorbed through the intact mucosa of the obstructed human small intestine. He suggested that an explanation of this pathological paradox might be that the poison made by the *Bacillus welchii* within the obstructed small bowel, and absorbed into the system of the human patient, might be the pseudotoxin already described. The toxæmia might not be due to the activity of bacteria at all. If it were, it seemed that the pseudotoxin was likely to be among the toxins taking part.

Dr. Lionel Bull (Melbourne) agreed with what Dr. Adey had said, except that he did not think that hæmolysis occurred in *Bacillus welchii* infections unless the blood stream was invaded. The organism of infectious entero-toxæmia was distinct from *Bacillus welchii*. He discussed the capacity of the secretions of normal bowel to activate the toxins of this organism. The capacity of the organism to cause symptoms in animals was distinctive, and there was no evidence of ovitoxicus infection in man. The disease was confined to ruminants and was not found in animals with a simple stomach.

Professor Woodruff, in reply to Professor Hercus, said that with regard to the shifting of sheep from one pasture to another, he thought that the exercise so obtained was more beneficial than the actual change of diet.

Virus Disease.

Dr. F. M. Burnet (Melbourne) opened a discussion on the problems of virus disease. He said that every infectious disease showed variability in the intensity of its attack. Many might on occasion manifest every grade of severity from an acutely fatal illness to a clinically unrecognizable form which could be detected only by the subsequent appearance of specific antibodies in the blood. These attacks of disease might be divided into frank and inapparent forms, inapparent infections being defined as those mild or completely asymptomatic infections in which a diagnosis of the disease in question could not be made on clinical grounds alone.

In thinking about infectious disease, it seemed useful to adopt an ecological point of view. In this the chief line of argument was the necessity for the continued survival of each of the contending species, vertebrate host and infecting microorganism. It was most advantageous for the survival of each species that the interaction, the most obvious manifestation of which was a typical attack of disease, should in the majority of instances be of a mild non-fatal character. In actual fact, recent work on practically all long-established endemic diseases indicated that a large proportion, sometimes an overwhelming proportion, of infections by the specific virus produced only an inapparent but immunizing infection. As examples of current interest might be mentioned poliomyelitis in American or Australian cities, and yellow fever in West African natives. In the veterinary field louping ill in sheep in Scotland and pseudo-rabies infection amongst swine in the mid-western States of America (Shope) might be instanced. In all these cases typical disease was far less frequent than inapparent infection.

Such behaviour was by no means confined to virus diseases. Diphtheria was an exhaustively studied example of a bacterial disease showing similar phenomena. In fact the tentative generalization might be made that with almost all endemic infectious diseases with substantial immunizing properties most individuals of the host species did not suffer from the disease. Confining the discussion for the present to human infections, three phases in the normal successful resistance to the disease could be distinguished: (i) maternally transmitted passive immunity, (ii) immunization during childhood by mild or completely inapparent infection, (iii) protection during adult life in virtue of this primary immunization reinforced by recurrent contact with the virus.

The age incidence of infectious diseases provided some interesting evidence of the importance of inapparent infections. The great majority of infectious diseases provided age incidence curves falling in one of two distinct groups, which were characteristic respectively of endemic diseases and of those diseases which occurred only sporadically in the population in question. Sporadic infectious diseases in a predominantly non-immune population showed a curve with a peak in the period of young adult life and a markedly low incidence during childhood. Typical examples in European populations living in the temperate zones were typhoid fever, lobar pneumonia, typhus fever, smallpox and psittacosis. There was evidence to suggest that similar curves would be obtained with almost any of the common endemic infectious diseases amongst a non-immune population. The curve was interpreted as signifying that during childhood a much higher proportion of infections were inapparent (according to the definition given above) than during early adult life.

With an endemic disease in a stable population non-immunes entered only by birth. The age incidence curve then showed a high peak during childhood, but the same relatively low proportion of frank to inapparent cases during childhood prevailed. By the time the "normal" period of highest susceptibility was reached, the vast majority of individuals had been immunized by one or the other type of infection. The proportion of apparent to inapparent cases differed widely with different diseases. Cerebro-spinal meningitis and poliomyelitis showed an enormous preponderance of inapparent infections, while measles and chickenpox provided the other extreme.

Interesting examples of change in age incidence of one disease were provided by the history of poliomyelitis in

previously unaffected Pacific islands—a maximal incidence in adults with few cases in children—and of smallpox in England during its period of greatest prevalence in the eighteenth century, when it was predominantly a disease affecting young children.

Applications of these points of view to virus diseases of current interest in Australia, psittacosis, poliomyelitis, *X* disease and infectious laryngo-tracheitis of fowls were briefly considered.

Professor H. K. Ward (Sydney) paid a tribute to the brilliant achievements of the groups of workers who had apparently opened the way to the ultimate control of epidemic influenza. He discussed various aspects of virus immunity and drew attention to Zinsser's observation that European typhus occurred in Boston and New York only among emigrants from the typhus countries of Europe. This suggested that the rickettsia persisted in the cells and that in a certain percentage of cases immunity broke down and a relapse resulted. In his opinion, in cases of long standing immunity it was more probably correct to suppose that the virus persisted in the cells continually stimulating antibody production than to suppose that the virus disappeared soon after infection and subsequent generations of cells continued to produce antibodies without any specific stimulation.

Dr. Lionel Bull (Melbourne) said that the fundamental principles on which knowledge of resistance to infectious diseases had been built, had been acquired mainly from the study of bacterial diseases. The existence of a fundamental mechanism which infection excited into activity with the production of immunity was certain. He likened the immunity reactions of the body to the reactions to foreign protein. Bacteria were far more complex in structure than were viruses, which were capable of giving rise to a stronger and more lasting immunity. He thought the reason for this was the fact that the viruses were intracellular parasites, while bacteria were not. In support of this, he said that a lasting immunity to east coast fever in animals was produced by *Theileria parva*, an intracellular protozoan, while little or no immunity was produced by *Piroplasma bigeminum*, an almost identical parasite which invaded the red blood cells only. He referred to the fundamental differences between viruses and bacteria and discussed the work of Sabine with regard to the mechanism of resistance to virus infections. Though the cells of the body were capable of reacting to different types of infection, he thought that there was only one mechanism of immunity in the animal body. He said that inapparent infections were found only in endemic areas. In the sphere of animal diseases there were viruses which were capable of killing 90% of the animals exposed to infection, and in these cases inapparent infections were unusual. He instanced South African horse sickness. He thought that the establishment of a more or less stabilized equilibrium between the virus and the host was a matter of time. Dr. Burnet had dealt mainly with diseases with only one host, in which more than one species was involved, as in rabies, and in bubonic plague, and in diseases in which man was only the chance host, no such equilibrium might exist, especially in the chance host. The inapparent infections appeared to be more common in diseases due to viruses of low pathogenicity, such as poliomyelitis and louping ill. He criticized Dr. Burnet's statement that the younger the individual, the more likely would a given infection be to take an inapparent form. It was difficult to find evidence for or against this view.

Dr. E. V. Keogh (Melbourne) drew attention to the technical problems involved in attempts at confirmation or disproof of the hypotheses advanced. In this connexion he regarded the refined technique of titration of virus suspensions and of antiviral sera on the chorion-allantoic membrane of the developing chick embryo, a technique developed within the past few months by Dr. Burnet, as of prime importance. He stated that the accuracy of such titration was of the order of five hundred times that of titration in the living animal as usually performed. The use of this technique, whereby one enumerated the actual number of lesions produced on a living membrane, and studied the modification of such lesions in appearance, size, time of appearance *et cetera* by immune sera, should lead to new conceptions of the modes of infection and survival of viruses. Such methods were in use in studying at the present time an epidemic of laryngo-tracheitis in fowls in New South Wales, and the results of such an investigation should have important bearing on the epidemiology of virus diseases in man.

Professor C. E. Hercus (New Zealand) stressed the importance of environmental factors in the relationship between host and parasite. He referred to the higher age incidence of poliomyelitis when that disease first became evident in New Zealand. Today the disease was more common in children. He thought that a state of equilibrium between parasite and host had been reached, as poliomyelitis was not now found in an epidemic state, but there were sporadic cases.

Dr. F. M. Burnet, in reply, said that he thought there was no essential difference in the epidemiology and immunity phenomena of bacteria and viruses. Persistent infection giving rise to immunity varied with the nature of the organism. It was unimportant in diseases such as yellow fever, but was important in diseases such as malaria and syphilis. He thought that repeated contact with the virus in a community was important in the persistence of immunity. He thought that in New Zealand epidemics of poliomyelitis were still likely to recur, even though a state of equilibrium appeared to have been reached.

Section of Pharmacology, Therapeutics and Anaesthesia.

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The Use and Abuse of Hypnotic Drugs.

Sir William Willcox (London), in opening a discussion on the use and abuse of hypnotic drugs, read a paper, the larger part of which had been published in *The British Medical Journal* of March 10, 1934, at page 415 (*quod vide*).

In the conclusions to his paper he stated that in prescribing hypnotics it was wise to select one, or a combination of the less toxic type of drugs, the action of which was well known. He had been so impressed by their toxic effects that he rarely prescribed any of the barbituric acid group of drugs or of the sulphonal group. Hypnotic drugs of toxic properties should be obtained only on the prescription from the medical adviser, and the prescription should be retained by the pharmacist and not repeated

except on medical authority and signature. The total quantity ordered on a prescription should be well under a fatal dose.

Legislation regarding the sale of poisons was under consideration [in Great Britain] as a result of the recent *Poisons and Pharmacy Act* which was passed in 1933. A close cooperation between the medical profession and those practising pharmacy was essential if dangers from hypnotic drugs were to be avoided.

PROFESSOR R. D. RUDOLF (Toronto) thought the discussion of insomnia might be simplified by discussing it under two headings: (i) irritability of the central nervous system, (ii) amount of irritation. Very little irritation such as noise or pain would cause insomnia. Hypnotics, with the exception of those that relieved pain, such as morphine *et cetera*, lessened the irritability of the central nervous system. Before using hypnotics one should lessen the amount of irritation. He was pleased to hear Sir William Willcox mention the use of acetyl salicylic acid in combination with barbiturates.

DR. F. L. DAVIES (Melbourne) asked as to the advisability of using barbiturate in pneumonia, and whether it would not be better to use something else.

DR. N. W. MARKWELL (Brisbane) thought that chloral hydrate and bromide of potash were the best hypnotics in pneumonia. He asked Sir William Willcox to state what he thought to be the best hypnotic in extreme wakefulness associated with weakness after prolonged fever —a condition described as post-critical delirium. The best treatment he himself knew was the use of bromide of potash. He thought that the condition was analogous to that of a patient suffering from coronary thrombosis who was almost moribund, but to whom large doses of morphine gave relief. In the type of case mentioned, large doses of bromide could be given without bromism showing itself. He thought "Amytal" to be a very satisfactory drug in coronary occlusion after the pain had been relieved by morphine.

DR. D. G. RENTON (Melbourne) asked if it was a common occurrence to find that the first dose of paraldehyde was satisfactory, but the second dose not satisfactory. He also asked whether barbiturate produced excitement instead of sedation. In his own personal experience with a dose of twelve grains of "Sodium amytal" given in divided doses, amnesia occurred for twenty-four hours, but he had been able to discuss matters rationally. Morphine relieved pain following operation in his own experience, but did not produce sleep. Chloral hydrate and bromide of potash gave excellent sleep.

DR. W. SIMMONS (Sydney) asked what Sir William Willcox recommended in insomnia of pregnancy.

DR. Z. MENNELL (London) said that Sir William Willcox had told him that "Hedonal" was not a barbiturate, although he himself thought it was, but "Hedonal" had not gone out of use as Sir William had said. It was being used daily in Russia. Many cases of pneumonia were reported after use of "Hedonal" and "Isopral", and they were wrongly attributed to the large amount of saline solution administered. He thought there was no difference between allergy and idiosyncrasy. He considered that amnesia following the use of "Avertin" and barbiturates lasted for twenty-four hours, and was a dangerous condition. Two times two made six and not four when one was dealing with drugs. Synergism played a large part in the action of drugs. The question of performing a lumbar or cisternal puncture was interesting, but it was a fact that it did bring back to consciousness patients who were suffering from the effects of barbiturates. He preferred morphine to heroin on account of the great respiratory depression of the latter. The synergism of heroin with "Evipan" was more marked than with morphine. Morphine given intravenously had a marvellous effect on the type of case quoted by Dr. Markwell, but required care and minute doses.

DR. B. L. STANTON (Melbourne) thought that the barbiturates were cumulative, as instanced by the marked effect of small doses in the treatment of high blood pressure. In the nervous irritability of children, small doses of barbiturates were beneficial. In treating a case of veronal poisoning with apomorphine a deeper coma had resulted. Codein in conjunction with aspirin was a very good analgesic and hypnotic.

DR. IVAN MAXWELL (Melbourne) thought that there was great danger in using a combination of barbiturates with analgesics such as amidopyrin. In the treatment of asthma ephedrine caused wakefulness. "Amytal" or "Luminal" were combined to produce a soothing effect. He would like to know Sir William Willcox's opinion. He had seen patients in whom one-half tablet of aspirin caused definite spasm of the bronchioles. Many asthmatics were susceptible to this drug. Skin tests showed no reaction. Finally, he wished to ask about the use of "Luminal" and bromide of potash in epilepsy.

Sir William Willcox, in reply, said he was pleased to see Professor Rudolf agreed with his views. In answer to Dr. Davies he said he did not think barbiturates should be used in pneumonia; they were not powerful enough. No drugs could cause pneumonia as much as they could. He had seen pneumonia following the use of three grains of "Nembutal"; this condition was confirmed by six other medical practitioners. He thought it was necessary to produce sleep in pneumonia during the first few days with such drugs as morphine and atropine. In reply to Dr. Markwell, he said that physical measures such as hot packs and sponging were better than drugs. They should try the simple methods first. He was rather timid about giving such large doses of bromide of potash as Dr. Markwell mentioned. In prescribing barbiturates it was advisable to use those to which one was accustomed. Sir William Willcox agreed with Dr. Renton concerning the use of paraldehyde. Morphine relieved pain and in a considerable percentage of people it caused excitement rather than sleep. He agreed with Dr. Mennell that two times two did not make four when one was dealing with drugs. In regard to Dr. Stanton's remarks, Sir William Willcox said that when he (Sir William Willcox) stated that the barbiturates were not cumulative he spoke as a chemist. They did not accumulate, but their effects did. Veronal took two to three days to be excreted, and if doses were given at short intervals then there was chemical accumulation. To Dr. Simmons he said that one had to consider the effects on the child in using hypnotics. It was wise to adopt simple methods. He did not recommend the use of barbiturates.

Urinary Antiseptics.

DR. J. THOMSON TAIT (Melbourne) opened a discussion on the subject of urinary antiseptics. He said that the subject could be introduced by offering for consideration two questions: "What can we expect from such drugs as are employed to overcome urinary infections?" "What is the basis of the pathology of such conditions?"

Drugs which had been shown *in vitro* to be inimical to the growth of certain bacteria, were administered by mouth or into the blood stream and ultimately reached the kidneys to be excreted into the system of urinary tubules and reservoirs before being evacuated from the body. As the normal renal pelvis could be seen to empty itself rapidly, it would seem that the sterilizing effect of any drug must be inefficient as far as the pelvis, calyces and ureter were concerned. In the urinary bladder some degree of stasis was usually present, and it was here that some antiseptic action of substances introduced into the urinary system could be expected. The great majority of urinary infections were blood-borne. Exceptions were cases in which bacteria had been introduced directly into the bladder, almost always by a catheter, and cases in which from a bladder already holding infected urine free reflux could take place to the renal pelves on account of the inadequacy of the uretero-vesical sphincter. It was difficult to prove that infection existed in the blood at any time, and the origin of such infection was equally difficult of proof. The gall-bladder should be considered in some cases, as patients had been cured of long-standing pyelitis by cholecystectomy. In most cases the bowel should be regarded as the source of the infection, and Dr. Tait thought that in any debilitated condition of the

patient undue absorption of bacilli of the coliform group took place through an unhealthy, but not necessarily diseased, mucous membrane. These bacteria were normally destroyed either in the cells of the mucosa or in the blood, but if the defensive mechanisms of the body were below normal, some bacilli reached the kidney and infected the urine. One of the main causes of such lowered resistance was mental exhaustion from over-work, worry and strain. In only a small proportion of patients with bacilluria could one obtain a definite history of bowel disturbance. Primary causes of increased bacillary absorption would be loss of the protective mucous covering from excessive purgation, damage of the epithelium from chronic intestinal stasis, or such inflammatory disease as colitis, appendicitis and cholecystitis.

A necessary preliminary to treatment was an exact diagnosis. Stone, tuberculosis, newgrowth and obstruction were all frequent causes of continued pyuria and bacilluria. The exact distribution of the infection should be determined by ureteral catheterization—pyelitis was often present on one or both sides without any local symptoms pointing to renal infection—and some estimate should be made of the anatomical changes which had occurred.

Many remedies had been introduced and widely advertised as cures for urinary infections. Hexamine, with its allied forms urotropine, "Uraseptine" and "Cystopurin", remained the most useful of the urinary antiseptics. It was effective in closed cavities of which the contents were not too quickly evacuated. It depended for its antiseptic action upon the liberation of formaldehyde in an acid medium. In most cases the acidity of the urine was sufficient, and only exceptionally was the administration of an acid necessary. The acid should of course never be mixed in the same prescription as the hexamine, and for the same reason this drug should be given when the acidity of the gastric juice was at its lowest. Hexamine was of value as a prophylactic against infection which might follow any operation or instrumentation upon the urinary tract, operations upon the female pelvic organs or upon the bowel. Hexyl-resorcinol, under the name of "Caprokol", had been tried as an alternative to hexamine. Its effect had been no greater and there had been certain disadvantages in its administration.

It was generally recognized that an alkaline medium was inimical to the growth of the *Bacillus coli communis*, and bacteriologists had found that some strains or members of the coliform group were equally intolerant of an acid medium. This was the basis of the treatment of these infections by ketogenic diet. Frequent changes in the reaction of the urine also assisted in its sterilization.

More recent additions to the list of urinary antiseptics were the dye preparations. Pyridium and "Neotropin" were compounds of pyridine and in addition to having a marked bactericidal action on cultures of cocci and *Bacillus coli*, possessed a distinct power of penetrating the tissues. "Neotropin" seemed to be the more easily tolerated. The tissue penetration of dye preparations was an important factor, and could be further employed by applying them directly to the infected mucous membrane. Flavine and mercurochrome had been used in this way, and their introduction directly into the blood stream had been advocated. In the patients with septicæmia to whom intravenous injections had been given, no lasting effect had been produced, and the immediate reactions had been very severe. The oldest of the dye antiseptics was methylene blue. It was usefully employed in capsule form with sandalwood oil.

When invasion by one of the coliform group of organisms was well established and recurrence or recrudescence occurred, the condition was notoriously resistant to treatment, and the search for a curative antiseptic was likely to be prolonged. An attempt had been made to point out why this was so. The position might be summed up in one phrase: "Blame not the urinary antiseptic, but the mode of life of the patient." Dr. Tait finally emphasized some points, attention to which might improve results: (i) The necessity of controlling the source of the infection. (ii) The building up of the natural bactericidal powers of the body. (iii) The insuring of a free flow of urine in an antiseptic fluid throughout all parts of the urinary tract.

Dr. H. Mortensen (Melbourne) said that the term "urinary antiseptic" was commonly applied to a drug given internally and excreted in urine, and therefore excluded drugs used locally. The number of urinary antiseptics had increased tremendously during recent years, but it was doubtful whether the efficacy of these drugs had increased to the same extent. Some of the more commonly used, such as hexamine, were excreted unchanged. A large group were excreted in altered form, being fixed in the blood stream or in the kidneys; for example, turpentine and copaiba. Some had a diuretic action, which led to an improvement of the condition, and this was thought to be due to antiseptic action. No ideal urinary antiseptic had yet been found. In the use of urinary antiseptic it was necessary to have an accurate diagnosis of the site of infection, the causative organism, the predisposing and exciting causes of the infection. Urinary antiseptics might be discussed under three headings: (i) those producing diuresis, (ii) those with direct antiseptic action, (iii) those producing an alteration in the reaction of the urine. Those antiseptics which had stood the test of time were hexamine and acriflavine. Heathcote, of Cairo, stated that two factors were necessary to attain antiseptic action when a patient was taking hexamine: (i) acidity of urine, (ii) a suitable time of exposure. As regards the potency of acidifiers, acid sodium phosphate had low acidifying value. It was better to use some such substance as ammonium chloride. Ammonium benzoate had a higher value than acid sodium phosphate. For coccal infection, Dr. Mortensen made mention of the use of arsenic preparations intravenously administered. They were of great value in resistant cases. Treatment by alkalinization in acute infections gave excellent results, large doses of potassium citrate or bicarbonate being used and the treatment being continued both night and day. Dr. Mortensen also mentioned the ketogenic diet in the treatment of urinary infections and the work of Clark thereon. He stated that an observer had claimed in the *Journal of Urology* antiseptic action on the urinary tract following the use of ten minims of nitro-hydrochloric acid (U.S.P.) three times daily. Dr. Mortensen referred to the inefficiency of hexamine in catheterization. In continuous catheterization with an indwelling catheter the bladder was always empty and the hexamine was unable to act, but in intermittent catheterization the bladder was full at intervals and the hexamine had time to act.

Dr. Ivan Maxwell (Melbourne) said that hexamine had to undergo decomposition into formaldehyde before becoming efficient. It was difficult to obtain a pH value of 5 that would cause decomposition and inhibit the growth of organisms. Not only was the patient unable to keep the urine in the bladder for a sufficient period of time, but the quick passage of urine from the pelvis of the kidney helped to cause the difficulty. In catheter retention cystitis it was found that hexamine had no therapeutic effect.

Sir William Willcox (London) thought that the whole field had been reviewed critically. He was in agreement with Dr. Tait and Dr. Mortensen. It was important when dealing with urinary antiseptics to change the antiseptic. One should give a drachm of citrate combined with potassium or sodium bicarbonate in each dose, and this should be pushed for three or four days; it should then be stopped and hexamine should be given. In England they were using "metramine compound"—a combination of hexamine and methylene blue—and from his experience it seemed to act better than when the drugs were given alone. Some patients found it difficult to tolerate a ketogenic diet. One aspect of urinary infection had not been mentioned, namely, vaccine treatment. If a vaccine was prepared and used judiciously it was a great addition to the treatment. Allergy played an important part in the treatment of disease. Some patients tolerated vaccines badly; they were allergic. Vaccine should be used scientifically, and the tolerance of the patient had to be determined. Vitamin preparations should not be forgotten in building up immunity.

The Action on Mammalian Circulation of the Skin Secretion of Hyla Aurea.

PROFESSOR W. A. OSBORNE (Melbourne) read a paper on the action on mammalian circulation of the skin secretion of *Hyla aurea*. He said that in 1930 he had described the remarkable action on the mammalian systemic arterioles of the secretion of the skin of the common Australian frog, *Hyla aurea*. Though the heart went into syncope, a high pressure remained in the systemic arteries owing to the spasm of the musculature of the arterioles being so great that escape of blood into the capillaries was prevented. Further experiments had been made to elucidate the action on the heart itself. Isolated heart preparations of cat and rabbit had been made after the method of Locke—oxygenated Ringer solution was perfused, under a constant head of pressure, through the coronary vessels. Glucose had not, however, been added to the saline solution. When to the perfusing fluid there was added some filtered saline solution in which the legs of a pithed frog were moved to and fro a few times, the heart invariably stopped beating. Professor Osborne had originally thought that this was a systolic spasm, but these experiments with the isolated heart had demonstrated clearly that the syncope was due to coronary closure. The passage of saline solution through the coronary vessels into the right heart had stopped completely, even if the ventricles were flabby and toneless. A curious feature of the constriction was that when it ceased, and this was usually abrupt as shown by the reappearance of drip, the heart resumed its beat in quite normal manner. This fact accounted for the phenomenon which he had several times observed after injection of the dilute skin secretion into the circulation of the curarized dog. The heart stopped as already described, and the arterial pressure fell as a rule slowly owing to strong arteriolar constriction; but occasionally during this slow fall the heart suddenly came into action and the arterial pressure mounted high in the vagotomized animal. Owing to the very high peripheral resistance, the heart might collapse a second time. Professor Osborne concluded that the substance in the skin secretion of *Hyla aurea* which produced intense arteriolar spasm also produced spasm of the coronary arteries.

Premedication and Basal Narcosis.

DR. F. W. GREEN (Melbourne) opened a discussion on premedication and basal narcosis. He began by referring to the controversy among anæsthetists regarding drugs used for premedication, and said that from the difference of opinion three points emerged: (i) That nervous and highly strung patients, and especially children, should receive some form of sedative drug treatment to ameliorate the psychic effect that was inevitable while they were waiting to be brought into the operating theatre. (ii) That adequate premedication greatly decreased the amount of general anæsthetic subsequently needed. (iii) That there was no form of premedicant treatment that was applicable to all cases; each case had to be considered as a separate entity and a suitable drug had to be administered.

Dr. Green discussed premedicant drugs in common use according to the method of administration. Of drugs given by mouth he chose two groups. In the first was chloretone. It was customary in one London hospital to give ten to fifteen grains before all ether anæsthesia. The patients seemed to be as comfortable as with a small dose of other narcotics and the after-vomiting was certainly less. In the second group he placed the barbiturates, "Sodium amytal" and "Nembutal". If these drugs were given at all, the dose should be large enough to insure that the patient was asleep before administration of the general anæsthetic was commenced. "Sodium amytal" should be given only to robust and virile types of patient; "Nembutal" should be reserved for women and the less vigorous type of male patient. The drawback to the use of "Sodium amytal" was the fall in blood pressure that it caused. It might be followed by a period of excitement; this, however, could be controlled by morphine. "Nembutal" was quicker in its action than "Sodium amytal", the fall in blood pressure was less, and the period of narcosis was much shorter. On the other hand, its sedative effect was much less and its action variable. Morphine should never be combined with the barbiturates.

Referring to drugs given intravenously and subcutaneously, Dr. Green said that when the barbiturates were given intravenously, the fall in blood pressure was greater than when the drug was given by mouth, and patients with an idiosyncrasy to the drug were more liable to receive an overdose. "Evipan sodium" caused a greater, though more evanescent, fall of blood pressure than the other barbiturates, and a degree of narcosis equivalent to the third stage of anæsthesia. It appeared to be rather a potent drug for this purpose until it had been further tested as an anæsthetic *per se*. The use of morphine before anæsthesia was becoming less frequent; and Dr. Green doubted whether hyoscine should ever be combined with morphine. If hyoscine was used, it should be used only when rebreathing was to be practised.

Of the drugs given by the rectum, Dr. Green found paraldehyde uncertain in its action. "Avertin" was the most generally suitable of all premedicants, provided that the dose was small and in proportion to the age, physical condition and weight of the patient.

In conclusion, Dr. Green referred to atropine. He said that it was the most valuable premedicant drug of all and should be used before all anæsthetic agents and in all cases except when the basal metabolic rate was high.

DR. W. I. T. HOTTEN (Sydney) said that for the most part he was in entire agreement with Dr. Green. He maintained that routine use of premedication was undesirable. Definite pathological conditions were often a contraindication to it. For those who feared anæsthetics some type of premedication was necessary; in the majority of cases it was sufficient to produce slight sedation. If a patient was calm and restful, it was a common occurrence for him to state afterwards that he had no sense of fear. In the condition of thyreotoxicosis deeper sedation was called for. It was better to use small doses of narcotic and to supplement it with inhalation anæsthesia. With gas and oxygen anæsthesia premedication was not only advisable, but necessary, with a view to lowering the metabolic rate. With gas and oxygen he gave "Nembutal", one and a half grains, the night before, and the same dose an hour and a half before operation. To robust men he also gave morphine, one-sixth of a grain, one half-hour before operation. When using ether he relied on "Nembutal" if premedication was deemed advisable. For deep sedation he had relied on paraldehyde in preference to "Avertin". Paraldehyde did not produce the same degree of narcosis as "Avertin", nor the same duration of post-operative unconsciousness. On the suggestion of Dr. Poate he had been giving paraldehyde, about six drachms in three to four ounces of whey. The mortality rate in a series of thyreotoxic cases which he had investigated was twice as high with "Avertin" narcosis as with paraldehyde.

DR. D. G. RENTON (Melbourne) said that the aims of premedication were (i) to abolish fear, (ii) to augment the effect of the anæsthetic, (iii) to reduce the amount of the anæsthetic. He thought that some of the drugs were more dangerous than the anæsthetic agent. Chloretone he found to be futile for premedication. He had given the barbiturates an extensive trial, first by the intravenous method, then orally. He disagreed with Dr. Green. Dr. Green's dosage was too great excepting in thyreotoxic cases. Small doses produced satisfactory results. Regarding the intravenous use of drugs, he was quite in agreement with Dr. Green. "Sodium evipan" was too dangerous to use to any extent, but it was sometimes useful. Of the drugs given subcutaneously, morphine was the best. He thought they could not do without it, although he granted that it produced vomiting. He had not seen it do any harm nor produce depression of respiration sufficient to cause trouble. Hyoscine could not be relied upon. With women patients it worked well, but in men it was uncertain. He did not regard paraldehyde as satisfactory in elderly people and he had had no experience with "Avertin". He had

abandoned the use of sedatives in children. Experienced nursing sisters had told him that there was more sickness in children following the use of premedication.

Sir William Willcox (London) said he was very interested in basal anæsthesia because he was interested in toxicology. Half the trouble with basal anæsthesia was due to advertisements given to medical men who accepted the statements that they were safe. A number of anæsthetists started with the idea of seeing only the good and not the bad; they should start with the idea that they were giving a toxic drug. He thought that in therapeutics not enough care was taken from a prophylactic point of view. He did not like surgeons prescribing much morphine. When one gave a basal anæsthetic it was the same as giving a dose of "Salvarsan". It was necessary to fortify the liver by means of glucose and alkalis beforehand. It was necessary to take care that the patient was not allergic. It was wise in these cases not to give the basal anæsthetics or else give them small doses. Patients with a *Bacillus coli* infection were susceptible to toxic drugs. Thyreotoxic patients were susceptible to the barbiturates. Chronic infections such as salpyngitis or diverticulitis added greatly to the risk. Patients with low blood pressure were susceptible to basal narcotics. There was always an element of danger with the barbiturates. If the patient was calm why should one seek trouble with basal anæsthesia? "Avertin" was a liver poison, but not a powerful one. If there was any evidence of liver defect it was wise to give half the usual dose. Paraldehyde caused hæmatemesis. It had a toxic action.

Dr. Gilbert Brown (Adelaide) thought that patients were nervous and needed premedication. The drug required should be selected according to the particular patient, the operation, and the view of the particular surgeon. He did not like the intravenous method of administration, excepting with "Sodium evipan". "Omnopon" had less effect in causing vomiting than morphine. He used hyoscine only before gas anæsthesia. After the use of four drachms of paraldehyde and one-sixth of a grain of morphine he had seen deep unconsciousness. "Avertin" and "Sodium evipan" were the best of the basal narcotics. Dosage of "Avertin" was governed by the patient. He had seen vomiting occur after operation when it was used, generally in the nervous type. He always gave atropine before ether in fairly large doses, but did not give it with gas anæsthesia, as it decreased the effect of the morphine. In his opinion premedication reduced fear and psychic shock and the amount of anæsthetic required. He also said that the barbiturates mitigated the toxic action of the cocaine or "Novocain".

Dr. E. C. Black (Adelaide) did not agree with the statement that a large number of patients required premedication. Children, well handled, did not come to the theatre in a very frightened condition. As to premedication before gas and oxygen anæsthesia, he thought that after experience one could manage well without it. The after-excitement following the use of "Nembutal" did away with any of its advantages. He saw no use for hyoscine.

Dr. F. L. Davies (Melbourne) asked whether premedication was necessary. He said that at present it was largely a matter of fashion fostered by manufacturing chemists. Surgeons were also to blame for advising their patients before the operation that they would go to sleep. The feelings of the patient should not sway the position. No adventitious drugs should be used unless some indication was given. Morphine had come into use with the closed method of administering ether. Its use had then been continued with the open method although it was contra-indicated.

Dr. Hugh Hunter (Sydney) said that he considered that premedication consisted of more than the use of drugs. It was of more importance to see the patient before the operation and to gain his confidence. That had just as much effect as some of the drugs used. Not all patients required sedation. If it was necessary to give some form of premedication only small doses should be given beforehand. It was inadvisable to promise a patient that he would go to sleep with small doses. It was better to tell them that they would feel calm. Amnesia resulted from small doses, and that was all that was necessary. Premedication did not always lessen the amount of inhalation anæsthesia.

Dr. Z. Mennell (London) said he had used chloretone and found it a valuable drug. He suggested using it *per rectum*. "Nembutal" given by the oral route was uncertain in its action. Its action was more regular when given intravenously. He disliked "Sodium evipan", but said it was useful in such operations as breaking down joint adhesions. Hyoscine was useful; he used it more than the barbiturates. Ethylene was thought in England to be too dangerous. It was wicked to bring hyperthyreoid women into the operating theatre without premedication. To children atropine could be given by the mouth. Morphine had its disadvantages; it caused vomiting. When given intravenously it was more certain in its action. He found that asthmatic patients always took anæsthetics well. The finest treatment for an asthmatic black in the face was a few drops of chloroform.

Gas Anæsthesia.

Dr. Geoffrey Kaye (Melbourne) opened a discussion on gas anæsthesia. He said that in ordinary gas anæsthesia with a water-flowmeter apparatus, the anæsthetic was delivered to the patient at atmospheric pressure, or at pressures little above the atmospheric. The positive pressure technique, originated by the late E. I. McKesson, enabled the anæsthetic to be delivered at any desired pressure from 0 to 40 millimetres of mercury above the atmospheric without alteration in its percentage composition. Special dry-flow apparatus was required, of which two types (the McKesson and the "Austox", its local imitation) were in use in Australia. With each, successful and economical use depended largely on accurate adjustment of the pressure control mechanism, the exhalation valve tension and the rebreather chamber.

Dr. Kaye then described certain conditions under which the use of positive pressure was helpful, illustrating them from personal experiences. These conditions were as follow:

1. Mask anæsthesia. Delivery at a positive pressure of two to three millimetres of mercury aided inhalation and pulmonary diffusion of gases. Pressures up to seven to ten millimetres of mercury or more might be required (*a*) to correct air intake due to a badly fitting mask, (*b*) to overcome respiratory obstruction (for example, during thyreoidectomy), (*c*) to aid diffusion of gases through the lung alveoli (as in emphysematous patients), (*d*) to sustain flagging respiration (as in shock or narcotic overdose).

2. Respiratory arrest. Dr. Kaye showed a McKesson "Nargraf" record of a case of respiratory arrest due to overdose of nitrous oxide, in which respiration had been restored by lung inflation with oxygen under positive pressure. He described this technique, and pointed out that it should not be employed in case of respiratory obstruction due to vomitus, lest the vomited matter be forced into the bronchial tree. Here, lowering of the head, aspiration of the pharynx and intubation and aspiration of the trachea should precede any attempt at insufflation of oxygen.

3. Endotracheal anæsthesia. The use of positive pressure in endotracheal gas anæsthesia counteracted dilution of the anæsthetic mixture by inhaled air in cases in which the tracheal tube did not wholly occlude the *rima glottidis*. It allowed flagging respiration to be sustained, especially in cerebral surgery, in which grave respiratory depression was frequently encountered. It enabled endotracheal gas anæsthesia to be continued by the insufflational technique in cases in which, for some reason, it was impossible to intubate the larynx with a wide bore catheter.

4. Open mouth operations. Gas anæsthesia by the nasal route was very suitable for minor dental operations, although major procedures required endotracheal anæsthesia. Pressures up to forty millimetres of mercury might be required for consistently good results, especially if the

oral pharynx was not adequately packed by the surgeon. In nose and throat surgery, endotracheal anæsthesia was occasionally impracticable, for example, in the presence of acute laryngitis or of retropharyngeal abscess. Such patients might be anæsthetized with gaseous anæsthetics, given nasally under pressure. The larynx being unguarded, great care was necessary lest asphyxia or inhalation of pus or blood should occur. The Trendelenburg posture should be used, the pharynx kept clean by aspiration, and the operation severely limited in scope and duration. Although indefensible as a routine measure, this technique had value in certain special conditions, for example, retropharyngeal abscess.

5. Thoracic surgery. Modern thoracic surgery owed its development to the introduction of endotracheal anæsthesia and non-toxic gaseous anæsthetics. The positive pressure technique had great advantages. It aided diffusion of gases through the lung alveoli—a diffusion already impaired by the disease process, by the postural respiratory embarrassment sometimes necessitated by the operation, and by collapse of the operated lung when the pleura was opened. It enabled the operated lung to be reexpanded at will, whether to aid respiration, to demonstrate bronchial fistulæ, to expel exudate from the pleural cavity or to mitigate pneumothorax during closure of the wound. It might be employed either in connexion with administration by mask (as for relatively minor operations, such as thoracotomy for empyema) or with endotracheal administration for operations upon the lung itself.

Dr. Kaye concluded by remarking that nasal and oral administration of gaseous anæsthetics, however convenient, was no safe substitute for endotracheal anæsthesia in cases in which the endotracheal technique should properly be employed. Positive pressure was a useful and, at times, an essential adjuvant to gas anæsthesia, but its use should be limited by a due discretion.

Professor A. B. P. Amies (Melbourne) said that as far as pressure in gas anæsthesia was concerned, nowhere was it more imperative than in the nasal administration of gas and oxygen. With a complete airtight system and a pressure control intranasal anæsthesia was used fairly extensively for a number of minor operations. The extent of the pressure depended on certain factors: (i) the nasal airway, (ii) efficient mouth packing. He used cotton wool packs rolled to the size of an apple. These were changed every one or two minutes. Many anæsthetists used gas under pressure all the time. A dental surgeon could cause obstruction by over-gagging, even when a pressure of thirty millimetres of mercury was used. Respiratory depression was caused by pressure on the lower jaw with a dental forceps. A factor militating against team work was rough manipulation of the mouth pack, forcing it beyond the anterior pillar of the fauces. The patient was only in a light third stage of anæsthesia. He preferred to have the patient sitting up or in a semi-supine position, the head resting comfortably in a position vertical to the thorax. The presence of blood or mucus interfered with the smoothness of anæsthesia. During the removal and replacement of the pack the pressure was temporarily increased. Females required no premedication for average short dental gas anæsthesia, but he could not be certain of males over 16 years of age. He preferred some form of premedication. He now used intranasal gas anæsthesia as a routine at the Dental Hospital.

Spinal Anæsthesia.

Dr. Leo Doyle (Melbourne) opened a discussion on the position of spinal anæsthesia in Australia. He said at the outset that he did not intend to survey the field of spinal anæsthesia in Australia, but merely to relate some experiences of his own and to make a few generalizations on the subject. He said that the old idea that the drug would float up and paralyse the vital centres in the medulla was gone, and that the fatal attacks of syncope of the old days were explained on the basis of a fall in the blood pressure, which was now recognized as being characteristic of the method. In addition to the discovery that the drug was not likely to ascend, the observation that the Trendelenburg position would obviate the upsets caused by the low blood pressure was one that helped to make the administration of spinal anæsthesia so safe. It had become recognized that the cause of headache after spinal anæsthesia was seepage of spinal fluid, and that the seepage could be prevented by using very fine needles and by keeping to the Trendelenburg position for a few hours after the operation had ceased.

The main advantage of spinal anæsthesia, in addition to analgesia of the operative field, was that it provided a complete relaxation of the abdominal muscles and blocked all passage of nervous impulses from the operation area to the cerebrum. Discussing statistics regarding the danger of spinal anæsthesia, Dr. Doyle said that mortality rates of the anæsthetic and of the operation should not be considered separately, but in combination. He felt quite sure that in any two series of one operation done by one surgeon, one series under spinal anæsthesia and the other under general anæsthesia, the spinal anæsthesia series would be the better, both as regards immediate mortality and as regards smoothness of the post-operative course. When one considered that in addition to this there was a complete abolition of the flow of painful shock-producing stimuli from the operation area to the cerebrum, spinal anæsthesia had much to recommend it. Dr. Doyle discussed the occurrence of pulmonary complications, and pointed out that the claim could not be substantiated that there was less possibility of such complications arising after spinal anæsthesia.

Regarding the contraindications to the use of spinal anæsthesia, Dr. Doyle mentioned them under three headings: (i) cardio-vascular conditions (low blood pressure and anæmia, angina, coronary thrombosis), (ii) nervous conditions (organic and functional) (iii) general (septic conditions of the blood stream and the height of the operative field). The absolute general indication for the use of spinal anæsthesia was an operation taking place below the umbilicus, and being of such a nature as to involve the possibility of surgical shock, or an operation which by the time taken in its performance would involve the possibility of pulmonary complications arising from protracted inhalation anæsthesia. He then gave a number of what he called optional indications. He admitted that they were open to argument; and he included in the list such procedures as gynæcological operations, inguinal herniotomy, prostatectomy, removal of hæmorrhoids and so forth. He discussed these in some detail, and referred to his own experiences in connexion with them. He made short reference to premedication and gave details of the technique adopted by him in spinal anæsthesia.

Dr. Gilbert Brown (Adelaide) thought spinal anæsthesia very satisfactory for certain purposes, but not as a routine method. He disliked it for minor operations. Its disadvantages were that the mortality rate was probably slightly higher than with inhalation anæsthesia. This had been lessened with the introduction of ephedrine. It was unsuitable with a highly nervous patient. The blood pressure was likely to fall and reactionary hæmorrhage could occur after the blood pressure rose again. Respiratory failure had occurred when the anæsthesia was too high. Headache, paralysis and failure of anæsthesia had been seen. He considered operations on the lower extremity in the presence of pulmonary disease and when gas anæsthesia was unavailable to be a general indication. More definite indications were operations for the cure of recurrent herniæ and prostatectomy. When relaxation was necessary, spinal anæsthesia could be used as an adjunct to gas anæsthesia in excision of the rectum. Personally he did not like high spinal anæsthesia, but it was excellent for operations up to the level of the umbilicus. Premedication should not be given in too large a dose. He used the barbiturates in preference to morphine, but not in large doses. A light "Percaine" solution had given him better results than any other drug. Headache and hiccup were complications he had met. Headache could be cured by placing the patient in the Trendelenburg position. It could be eliminated by concentrated rectal injections of magnesium sulphate. "Carbogen" could relieve hiccup.

Dr. R. F. O'Sullivan (Melbourne) said he had started to use spinal anæsthesia in gynæcological cases after persuasion by Dr. Doyle, and used it as a routine method unless there were special contraindications. He obtained greater abdominal relaxation and smoothness of respiration. The patients were a shorter time in hospital, post-operative convalescence was easier and there was no post-operative shock. In a series of 400 operations with this method he had not seen one case of abdominal distension. There was next to no vomiting and headache was uncommon. By increasing his doses he had found that the vomiting practically stopped. The average time of anæsthesia he obtained was one hour and twenty-five minutes, but in one case it had lasted for two hours twenty minutes.

Dr. Z. Mennell (London) said that his experience had dated from 1904. Spinal anæsthesia came second on the list of all anæsthetics in causing pulmonary complications. The first on the list was local anæsthesia. This might have been accounted for by the fact that the patients probably had chest trouble. He had seen most appalling headaches following spinal anæsthesia, for which the best treatment was the Trendelenburg position, large doses of magnesium sulphate and lumbar puncture. Gynæcologists approved of spinal anæsthesia because they used the Trendelenburg position, and the method should never be used except when the patient was in this position. It was wonderful for intestinal obstruction. Lately he had used "Avertin" in small doses sufficient to make the patient sleepy as a preliminary to this method. Although "Avertin" lowered the blood pressure, it acted well. He had seen a number of surgeons use this method of anæsthesia for prostatectomy and after a period of a year or so give it up.

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Sea-Bathing and Surgical Tuberculosis.

Sir Henry Gauvain (Alton) read a paper on the treatment of surgical tuberculosis by sea-bathing. He said that sea-bathing was not only a pleasure, but when properly directed was a valuable therapeutic procedure. He referred shortly to the history of sea-bathing as used for therapeutic purposes by Lettsom and by Richard Russel. He then referred particularly to sea-bathing as used at the Cripples' Hospital with which he was associated at Alton, Great Britain. A marine hospital for the treatment of tuberculous cripples should be situated where the climate was mild and equable; there should be abundant sunlight of high actinic value; the rainfall should be low; there should be an absence of mists and fogs, and there should be no atmospheric or water pollution. The hospital should be situated right on the beach and in the closest proximity to the sea that was readily obtainable. It should be remote from a town, so that patients had unrestricted use of the beach for the purposes of treatment and pleasure without interference from visitors. At the same time absence of visitors meant that the patients were not a source of annoyance, repulsion or even danger to others. At Alton the parent hospital was situated inland at some distance from the marine hospital; the patients were conveyed from one to the other by motor ambulance. At first it had been hoped that the more weakly patients who were responding only slowly to treatment would improve rapidly, but that rarely happened. The weakly, cachectic, freckled, marasmic child, the child with a muddy complexion, lethargic in habit, who did not bronze readily on exposure to sunlight, with little power of response to natural stimuli, rarely did well. Very few ill children under the age of five derived real benefit. Suitable children were those of good constitution who, even if their local lesions were causing anxiety, could react satisfactorily. Children doing well, over the age of five, with good digestion, who sunburned readily, who were braced by exposure to cold air, who reacted to natural stimuli, would almost always do better still at the seaside. Children who responded well to sun treatment inland, but who reached a point at which further progress was arrested, made remarkable progress.

The effect of open air and marine treatment was to raise the basal metabolism; this was not due to sun treatment, but to exposure to cold air. Excessive continuous increase of basal metabolism was often harmful and was to be deprecated. Sudden and temporary increase of basal metabolism was highly beneficial if followed by a feeling of well-being and exhilaration; beyond that point it should not be pressed. Sir Henry Gauvain concluded by giving details of the technique adopted at Alton. He hoped that sea-bathing, instead of being a craze and a cult, would receive due attention as a therapeutic measure.

The Incidence of Pleural Effusion in Artificial Pneumothorax.

Dr. D. B. Rosenthal (Mont Park, Victoria) opened a discussion on the incidence of pleural effusion in artificial pneumothorax, with special reference to medical treatment. He said that the limitation of the application of artificial pneumothorax in the treatment of pulmonary tuberculosis depended on two factors: (i) the stage of the disease, (ii) complications that might arise, in part at least the result of the treatment itself. Of these complications the commonest and the most disturbing was the development of a pleural effusion. Whilst the presence of pleural fluid in a pneumothorax cavity might be attended by no untoward effects, three undesirable sequelæ might be considered: (i) great thickening of the pleura, preventing satisfactory reexpansion of the lung; (ii) premature obliteration of the artificial pneumothorax space by organization of the fibrin in the fluid; (iii) the fluid might become purulent. Dr. Rosenthal then proceeded to discuss the incidence of effusion in fifty-four cases of pulmonary tuberculosis in which artificial pneumothorax had been induced as a therapeutic measure. He excluded from his review cases in which (*a*) artificial pneumothorax was induced for diagnostic purposes, (*b*) artificial pneumothorax was induced after aspiration of a pleural effusion already present, (*c*) pleural effusion had followed the deliberate insertion into the pleural space of an irritant.

Dr. Rosenthal quoted references from the literature to show that in pulmonary tuberculosis, in about half the cases of artificial pneumothorax effusion might be expected

to occur and that empyema might be expected in about 5% to 10% of patients in whom artificial pneumothorax was established.

During the two-year period April, 1933, to March, 1935, 629 patients had been admitted to the Gresswell Sanatorium, Mont Park. Of these, 54 received artificial pneumothorax. Of the 54 patients, 13 (24%) had no effusion; 25 (46%) had small effusions; 16 (29%) had larger effusions. Of the 25 with small effusions, 18 (33%) had small "puddles" only; seven (13%) had effusions which covered the diaphragm. Of the 16 with larger effusions, nine (16%) had serous or sero-fibrinous effusions; seven (13%) had sero-purulent or purulent effusions. Thus 41 of the 54 patients developed effusion; and Dr. Rosenthal pointed out that if the patients with only a small "puddle" filling the costo-phrenic angle were excluded, the number of effusions was 23, or 43% of the total. In regard to adhesions, he said that it was impossible to draw accurate conclusions, but there was a suggestive association between the occurrence of fluid and the presence of adhesions, particularly in certain groups. Adhesions of some degree had been present in 46 of the 54 cases. The adhesions ranged from fine bands to massive strands holding the lung to the chest wall over a considerable area.

Dr. Rosenthal had stated in his introductory remarks that his thesis was that trauma to the pleura in one way or another was the main provocative cause of effusion. In discussing the possible ætiological factors, he said that trauma to the pleura might occur in many ways, separately or together. The chief factors were repeated puncture of the parietal pleura, introduction of a foreign body into the pleural space, high intrapleural pressure, rupture of adhesions. The second possible ætiological factor which he considered was tuberculous infection. Several writers had suggested that the effusions were the result of tuberculous pleurisy. Dr. Rosenthal pointed out that of the 541 patients who were not subjected to artificial pneumothorax, 33, or less than 7%, had pleural effusion. When in the parallel artificial pneumothorax group effusion was present in 43%, he felt that there was some justification for the view that pleural effusion in artificial pneumothorax was not solely due to tuberculous pleurisy. The other possible ætiological factors referred to by Dr. Rosenthal were exacerbation of contralateral disease, climatic effect and calcium deficiency. The two first of these he dismissed in a few words. In regard to calcium deficiency, however, he quoted the work of Pisani and Smejkal on the prophylactic administration of calcium preparations as a preventive of pleural effusion. He pointed out that these workers had suggested that pleural effusion in these cases was due to: (i) increased permeability of the capillaries because of oxygen lack, (ii) increased osmosis, (iii) higher concentration of hydrogen ions, (iv) calcium deficiency of the pleura, (v) aspirating effect of the endopleural negatfve pressure. The view was held that the use of calcium inhibited some of these factors. After outlining the objections to the hypothesis of Pisani and Smejkal, Dr. Rosenthal said that he had treated a series of patients with calcium gluconate. Of the last thirteen patients, seven had served as controls and six had received the drug. He summarized the results and said that while the series was too small to justify the drawing of definite conclusions, it did not appear that calcium gluconate would be efficacious in preventing effusion in artificial pneumothorax.

Dr. Rosenthal's general conclusion was that pleural effusion in artificial pneumothorax was due to a combination of trauma and infection. Small effusions were due to trauma only and were reactionary; larger effusions were due to trauma *plus* infection; a relatively small proportion of effusions was due to tuberculous pleurisy.

Dr. A. J. Collins (Sydney) said that in large effusions high specific gravity and cellular elements in most instances demonstrated their infective character. A negative bacteriological finding did not preclude tuberculosis. Smaller effusions were usually not tested. At the Royal Prince Alfred Hospital, Sydney, 29 out of 76 patients had small effusions, all but six occurring late—after six months—suggesting that the reaction of the pleura to air was unimportant. Most of them, he agreed, occurred in patients with pleural adhesions, but he did not agree that the presence of adhesions was an argument for trauma as the prime factor in effusions. Rather, he thought, rupture of adhesions was part of a natural process due to pleural spread of infection and ending in tuberculous pleurisy. Trauma might cause a few of the small effusions. Repeated puncture through the same spot caused thickening and contusion with oozing. After pneumolysis small effusions occurred. Of 76 patients treated in five years at the Royal Prince Alfred Hospital by artificial pneumothorax and analysed by Dr. W. Morrow and Dr. D. Bye, 41 (54%) developed chest effusions, 12 (16%) large effusions. Of the large effusions, five later contained tubercle bacilli. Dr. Rosenthal had stated that because only 7% of tuberculous patients not treated by artificial pneumothorax developed effusions, tuberculosis was not the cause of the effusion in 50% of patients under special treatment. Dr. Collins did not accept this statement. Many patients had early infections rapidly improving, whereas those treated were doubtless specially chosen as not likely to be naturally cured. Such dissimilar groups could not be compared. Had the patients in the former group been under close radiological supervision, as in the special group, small effusions would probably have been found in higher proportion. Trauma might cause small transitory effusion at any stage, but the majority of effusions, large or small, were tuberculous. The reasons were: (i) the physical characters of the fluid, (ii) the persistence for weeks, even months, (iii) that adhesions themselves were evidence of previous pleural infection, in these cases probably tuberculous, and (iv) effusions sometimes developed after discontinuance of treatment, and usually such patients deteriorated in health.

Dr. D. R. W. Cowan (Adelaide) said that in the early cases, after three months' trial of ordinary measures, he advocated special treatment; effusion was common and the expanding process became slow. After discontinuance of treatment a large negative pressure might develop. Fluid as a rule needed no interference unless unpleasant symptoms appeared.

Dr. J. Bell Ferguson (Melbourne) pointed out that Dr. Rosenthal had been able to follow up his own patients' cases for years and could avoid the discrepancies of different observers. Effusion tended to occur where the pressure increased rapidly. He agreed that small effusions were best left alone, and in large effusions with dyspnœa, tachycardia, a sense of oppression *et cetera*, frequent aspiration and replacement by air was indicated. He had tried "Metaphan", 1 in 2,000, in olive oil, but now preferred to use it in gelatine (2%) instead.

Dr. L. B. Elwell (Brisbane) recorded his experience in Vienna with Neumann, who claimed only 2% of complications by effusion. Even allowing for those not above the level of the diaphragm, Dr. Rosenthal gave 10% above this level. If trauma were the cause, Neumann's technique would favour effusion. Rapid inflation, using a rubber bulb and a refill of 1,000 cubic centimetres, was practised. Air embolism occurred in three or four cases a year, with convulsions, hemiplegia or facial palsy. In Britain and France air embolism was rare. In 150 cases Dr. Elwell had used tuberculin with good results without effusion. Even although infection, not trauma, were the cause, the specific tuberculous process could be inhibited by tuberculin.

Dr. A. S. Walker (Sydney) contended that the effusions were exudates, not transudates, even when occurring after cessation of pneumothorax treatment. Soon after the beginning of treatment a sharp febrile reaction might occur, due to the occurrence of exudate with the spread of infection. Particularly important were the economic conditions. A large effusion was a sinister happening. Aspiration and replacement of air should be as infrequent as possible.

Dr. H. Watson (Melbourne) found the oil basis for "Gomenal" unsuitable, as it tended to float on top of the effusion. Acriflavine, 1 part in 500 of gelatine, was useful. "Metaphan" in gelatine was on trial and was useful. Owing to the thickening of pleura, recovery might be slow.

Dr. W. J. Newing (Melbourne) criticized the old type of air filter, which he thought might spread infection.

Dr. Rosenthal, in reply, said that trauma precipitated the process and that these infusions would not have occurred but for artificial pneumothorax. All fluids aspirated were exudates, but this did not disprove the traumatic effect as the primary factor. He considered the general conditions to be important. Patients should be able to live under good conditions. Alcoholic patients often did badly.

The Treatment of Tuberculous Empyema.

DR. M. P. SUSMAN (Sydney) opened a discussion on the treatment of tuberculous empyema. He said that in discussing the treatment of any tuberculous lesion it was necessary to stress a commonplace—that a tuberculous patient and not merely a local lesion was being treated. Constitutional treatment was therefore essential throughout. It was also necessary to remember that, although a certain amount of standardization was necessary and desirable, each patient should receive individual treatment. Dr. Susman then briefly discussed the methods and principles of treatment. In regard to the choice of treatment, he said that the factors that determined the treatment to be adopted were: (i) the state of the lung or lungs, (ii) the presence or absence of pyogenic infection. Subsidiary factors included the age and general condition of the patient, the age of the empyema, the presence of bronchial or cutaneous fistulæ, the presence of tuberculosis elsewhere, and the severity of the infection and the response to preliminary treatment. He discussed the details of treatment under four headings, as follow: Group A, when there were no signs of pulmonary tuberculosis and there were no pyogenic organisms in the empyema; Group B, when pulmonary tuberculosis was known to be present, but there were no pyogenic organisms in the empyema; Group C, when there were no signs of pulmonary tuberculosis and pyogenic organisms were present in the empyema; Group D, when pulmonary tuberculosis was known to be present and pyogenic organisms were present in the empyema.

In the treatment of Group A the object was to free the pleural cavity of pus and to secure obliteration of the cavity by getting the lung to expand. Aspiration alone might suffice, but it was usually necessary to supplement this by air replacement in decreasing amounts, by an injection of 5·0 cubic centimetres of 2% methylene blue to sterilize the effusion, or by pleural lavage. It might be necessary to perform thoracoplasty if the lung expanded to a certain point and then stopped, or if the lung failed to expand at all and the fluid persistently reformed. The important thing was to get the thoracoplasty done before secondary infection occurred. If the empyema was an old one and the outer wall was a thick layer of granulation tissue, it might be necessary to excise this wall or make a flap from it.

In the treatment of Group B the aim was to cure the empyema and at the same time to treat the underlying lung by keeping the lung collapsed. Amounts of air were put in to keep the lung unexpanded. If the lung tended to expand in spite of the air refills, or if effusion persistently recurred, oleothorax should be tried. If the oleothorax failed, thoracoplasty with phrenic avulsion was performed. If thoracoplasty was contraindicated by the patient's general condition or by disease in the opposite lung, intercostal drainage and lavage might tide him over until he was fit for thoracoplasty; if he did not improve enough, the drainage would have to be permanent. There was an exception to these rules: if the tuberculous empyema followed artificial pneumothorax late in the course of treatment, the lung might have recovered so much that it might be safely allowed to expand, as in Group A.

In Group C the objective was the same as in Group A, but often the secondary infection was too severe for the simpler methods of treatment. Simple methods as a rule brought about improvement only; then closed intercostal drainage *plus* irrigation should be used if no bronchial fistula was present. Oleothorax might be tried before the drainage, but the results were variable. When a large bronchial fistula was present, rib resection and open drainage were the best methods of treatment. Very rarely the fistula closed and the lung reexpanded. Most of the patients needed a complete thoracoplasty. Neither cutaneous fistula nor bronchial fistula was a contraindication; both might be cured by the operation. The severity of the infection should be reduced as far as possible by frequent irrigations and so forth before the thoracoplasty was performed.

The patients in Group D had the worst prognosis. The survivors, with few or no exceptions, would require a total thoracoplasty. The preliminary treatment was much the same as in Group C, but once the secondary infection was under control, the thoracoplasty should be done as soon as possible, lest the lung should start to expand. If the patient remained too ill for thoracoplasty, permanent drainage and irrigation were all that was left.

At this stage Dr. Susman discussed some of the technical points of aspiration, pleural lavage, oleothorax, intercostal drainage, rib resection and drainage, phrenic paralysis and thoracoplasty operations. He pointed out that the mortality of tuberculous empyema was between 30% and 50%. The chief causes of death were secondary infection and tuberculosis of the lungs; less common causes were tuberculous meningitis and generalized tuberculosis. He concluded by giving illustrative histories of patients in Groups B, C and D. He said that he had never seen a patient who would be regarded as belonging to Group A.

DR. A. S. WALKER (Sydney) said that tuberculous empyemata were uncommon, but a grave anxiety. Methylene blue, and perhaps "Metaphan", might prevent recurrence. Lavage was useful, but the fluid was often difficult to remove. Often it felt as though the pleura was gelatinous and that the lung was creeping up alongside the pus. Closed drainage was important. Mere passive inertia was undesirable. One should be ready when necessary to consult the thoracic surgeon. Contralateral disease made a difference. Secondary infection was not necessarily fatal.

DR. H. SEARBY (Melbourne) agreed that the patient, not the focus, needed attention. Too often the surgeon saw only the physician's failures. Class A were, in his experience, very few. In Class B, if the lung expanded, the empyema disappeared. In post-operative empyema rib resection might be necessary. All secondary infections required rib resection, and all these patients were very ill.

DR. LEO DOYLE (Melbourne) said that if thoracoplasty was going to be necessary, it should be done while the patient was still in good condition. The operation was not popular; people feared it, and so it was postponed until its best results could not be obtained.

DR. G. A. PENINGTON (Melbourne) said that he washed out the pleural cavity with a 1 in 2,000 watery solution of "Metaphan" and watched the progress of the patient by taking serial cultures (one drop on blood agar). As pneumococci increased, the patient's condition improved. Cultivation of *Bacillus influenzæ* was difficult.

DR. D. R. W. COWAN (Adelaide) hoped that these operations might, by help of early diagnosis, become things of the past. They should try to keep the condition a closed infection; he favoured washing out the pleura with saline solution without antiseptics.

DR. R. B. ROSENTHAL (Melbourne) said that he strongly favoured closed drainage as helping expansion. "Gomenal", in thickening the pleura, might delay expansion. In oleothorax fistula might occur. He preferred lavage with bland fluids, such as eusol and saline solution.

Dr. M. P. Susman, in reply, said that while he favoured closed drainage, in Wales good results were claimed by the use of slow steady drainage with a tube into a bottle. For rib resection he preferred gas and oxygen general anæsthesia instead of local anæsthesia. "Metaphan" seemed promising. Thoracoplasty might become a necessity. Brompton Hospital experience with oleothorax was favourable, and fistula might be cured by this method.

Tropical Medicine.

Dr. G. Carmichael Low (London) opened a discussion on tropical medicine. He said that it was his intention to survey some of the discoveries that had been made in tropical medicine since the beginning of the century. Diseases of the tropics differed in many respects from those found in temperate zones, and it was this difference which had led Manson to institute special schools for the study of tropical diseases. It had been said that there was no such thing as tropical medicine, but this view was quite incorrect. There were many diseases, such as trypanosomiasis, sprue and yellow fever, which were restricted to the hot parts of the globe; and there were others, such as malaria, dysentery and cholera, which occurred in temperate climates, but were more common in the tropics. Another feature which differentiated tropical diseases was that in many instances insects played a part in their transmission. Tropical diseases also were more often associated with protozoal and helminthic parasites than were the diseases of other parts of the world. Those desirous of practising medicine in the tropics should have a sound foundation of general medical knowledge; and they required also much special knowledge, and this included a special training in protozoology, entomology and helminthology.

Dr. Low pointed out that after the foundation of special schools at Liverpool and London for the study of tropical diseases, France, Germany and Belgium had established similar schools. America had schools, and the British Navy, Army and Air Force had special courses for their officers; while more recently the Empire had carried on the good work by founding institutes in Calcutta and Sydney. Dr. Low pointed out that during the last twenty-five years the lot of a patient arriving in London with a tropical disease infection had changed. He thought that during the last thirty-five years the advances that had taken place in tropical medicine rivalled or even excelled those of any other period in the history of medicine.

Dr. Low then dealt in some detail with various tropical conditions: filariasis, yellow fever and trypanosomiasis, kala-azar, helminthic diseases, intravenous antimony treatment in sleeping sickness, plague and beri-beri. He said that the examples that he had given did not in any way exhaust the remarkable discoveries made during the last thirty-five years, but they served to illustrate the importance of this branch of medicine as a special subject. It had been said that the great discoveries of tropical medicine had already been made. This might be true in one sense, but there still remained important discoveries to be made; for instance, the causes of blackwater fever and sprue were undetermined. It was perhaps in the realms of biological chemistry and laboratory research that future discoveries would be made.

Tropical medicine was of great importance to Australia. Already Australia had malaria, sprue, dysentery, ulcerating granuloma, yaws, leprosy, dengue and filariasis; and, if care were not taken, other diseases and parasites might be introduced. The founding of a tropical school in Sydney showed, however, that Australia was alive to the danger. If doctors who were destined for the northern and mandated territories were given an adequate training, all would be well. The success of any enterprise in a tropical country was directly proportional to the extent to which tropical diseases were controlled by a proper practice of tropical medicine in all its aspects.

Dr. C. L. Park (League of Nations Health Organization) also contributed to the opening of the discussion. He said that among the distinctions which Dr. Low had drawn between diseases in the tropics and elsewhere was the increased prevalence of certain of them in tropical countries. The prevalence of what were termed the major infectious diseases—plague, cholera and smallpox—in eastern countries and the lack of information regarding their occurrence had induced the League of Nations in 1925 to establish an Epidemiological Intelligence Bureau in Singapore. This bureau was kept informed by cable of the development and course of such diseases in every country throughout the East, and disseminated the information by wireless and cable.

Dr. Park discussed the incidence of plague in India, the Netherlands Indies and China, and said that in India the use of Haffkine's vaccine occupied a primary position among plague-preventive measures, along with the application of specific anti-rat measures. In Java, following the advent of plague, a scheme of house reconstruction had been carried out in each area, the aim of which was to destroy and prevent rat harbourage. The rat was literally built out; the bamboo used was filled up so that the rat was displaced from the roof to the ground, where it could be seen and dealt with. In addition, large scale mass inoculation with a living avirulent vaccine prepared by Otten in Bandoeng was being used with most encouraging results. A protection of over 95% was claimed. The prevention of transfer from one country to another consisted of measures of deratization, applied regularly, and rat-proofing of vessels.

Among the measures which had been used to reduce the cholera mortality were a piped water supply and inoculation. The striking decrease in mortality in Bangkok, Saigon and the Netherlands Indies was due in great measure to a combination of these. Bacteriophage had also been used; its value was uncertain, but it did reduce infectivity and thus indirectly the epidemic spread.

India was the principal focus of smallpox. The epidemic season, not only in India, but in the near and far East, tended to be limited to the first half of the year, with a peak in March and April, but its approach could often be forecasted by a rising incidence towards the end of the year. Particularly favourable was the situation in Java, where in 1932 only thirty-nine cases occurred in a population of forty-two million. This was entirely due to systematic vaccination and revaccination.

Plague, cholera and smallpox were not the principal causes of illness in the tropics; those associated with protozoal and helminthic parasites were more widespread. The greatest cause of morbidity in the tropical and subtropical countries of the East was undoubtedly malaria. Bentley had estimated the number of cases in India at one hundred million. An average of eleven million patients received treatment every year in hospitals and dispensaries. Malaria also accounted for from 10% to 57% of the total admissions to hospital from communicable diseases in Ceylon, Malaya and Indo-China. The control of the disease was essentially a local problem, which depended on the habits of the vector, but that local control was possible was made abundantly evident by a study of the history of the disease in places such as the Straits Settlements.

Dr. F. W. P. Cluver (South Africa) recounted experiences in Zululand with the malaria problem. Here antilarval measures were a failure, but antiadult measures a success. Two vectors of malaria existed: *Anopheles costalis* and *Anopheles funestus*. Costalis was responsible for epidemic spread, funestus for endemic occurrence. Costalis bred in puddles, in hoofmarks found round watering places. Draining swamps only exaggerated the difficulty; a ring fence would have been better. Antiadult measures against costalis were adopted with success. Costalis was a hut frequenter. Weekly sprays with insecticide represented two attacks on the female before she could complete the cycle of infection. A death rate of 10,000 a year from malaria in a million persons was now reduced to very small proportions. In certain areas the native had immunity to the extent of freedom from invalidism, yet new natives from the high veldt all rapidly became malarious. Propaganda was essential, for natives were suspicious, superstitious and under the influence of the witch-doctor. Quinine was distributed free of cost.

In answer to Dr. John Dale (Melbourne), Dr. C. L. Park (Singapore) said all the smallpox epidemics referred to were of the severe type.

Dr. A. Brennan (New Guinea) stated that in the Mandated Territory of New Guinea the vector bred in clear water and sunlight. In bush country particularly Gambusia fish had been successful. Natives helped in the breeding and distribution into pig-wallows, streams *et cetera*. The spleen rate had dropped from 35% or 40% to 4%, and the infantile mortality had dropped.

Professor Harvey Sutton (Sydney) commented on the need for studying each local problem on its own merits. In Palestine canalization, bank construction and scrub removal were eminently successful, but in the Federated Malay States or in New Guinea would not have been effective. The services of a trained entomologist were indispensable. The Australian medical officers were quite inexperienced in clinical malaria, but thanks to a special course by Dr. Bahr, now Manson-Bahr, they were trained to watch for and handle malignant tertian malaria with a resultant saving of thousands of lives when the great epidemic arose after penetration of an enemy territory. In the northern part of Australia there occurred sprue, yaws, *granuloma pudendæ* leprosy and malaria—diseases which did not come within the experience of the medical student in Sydney, Adelaide, Melbourne. Hence, a course of tropical medicine became an essential for practitioners. Working in this area the Sydney school was now recognized by the Colonial Office.

Professor J. Gunn (Melbourne) asked if ports were protected, especially referring to Bombay.

Dr. C. L. Park replied: Anyone might go ashore at any port, but local rules might apply, as at Bombay, which might require that all leaving the port should be vaccinated.

Dr. G. Carmichael Low (London) said that he recommended quinine at night. York had shown that sporozoa in the serum were not killed, but were affected in the corpuscles. Those who took quinine at night had less malaria and to a less degree suffered less from blackwater fever. He had recommended also to the British Medical Association party vaccination and inoculation against typhoid and paratyphoid *A* and *B* infections.

Dr. A. Graham Butler (Canberra) criticized the separation of diseases as tropical. The black death in Europe was plague; England suffered severely from malaria; ankylostomiasis occurred in Cornwall and Mont Cenis. The climate factor was a dangerous doctrine and the matter one rather of education and applicability. Amœbic dysentery, for example, occurred in outbreaks in asylums, but did not occur among the intelligent population.

Dr. G. Carmichael Low pointed out that tropical diseases, though their chief intensity was in the tropics, then spread into the subtropics, for example, malaria in Italy. Hookworm was prevalent in mines and tunnels because of the high humidity and temperature.

Weil's Disease in North Queensland.

Dr. T. J. Cotter (Townsville) contributed a paper on Weil's disease in north Queensland. He said that in October, 1933, there appeared at Ingham the first of a series of outbreaks of a disease regarded by Dr. G. C. Morrissey and Dr. T. Leckie as being entirely new to the district; the condition had been diagnosed clinically by them as Weil's disease. This was the first known occurrence of Weil's disease in Australia. From October, 1933, over a period of a little more than four months, forty cases had occurred, the appearance of the disease being sporadic. In June, 1934, a recurrence had taken place, thirty-two cases being seen over a period of three weeks. After a short period of quiescence eighty cases had made their appearance within ten days in August. In September, 1934, six cases had been seen within one week.

Dr. Cotter described the symptoms and clinical course of the disease. He said that sections of organs from fatal cases had been examined at the School of Public Health and Tropical Medicine, Sydney, and had revealed findings consistent with those found in Weil's disease. He also described field investigations undertaken by Dr. W. C. Sawers, of the School of Public Health and Tropical Medicine, in which typical leptospiræ were isolated. Dr. Cotter discussed the prevention of the condition and drew attention to the difficulties connected with it. He laid stress on the importance of the condition from an industrial point of view, and he said that laboratory investigations were being actively prosecuted at the School of Public Health and Tropical Medicine, Sydney, at the Commonwealth Serum Laboratories and at the Commonwealth Health Laboratories at Cairns and Townsville.

Section of Medical Sociology.

President: E. Kaye Le Fleming, M.D. (Wimborne).

Vice-Presidents: D. G. Croll, C.B.E., M.D. (Brisbane); The Reverend John Flynn, O.B.E. (Sydney); Professor J. A. Gunn, B.Sc., M.A., Ph.D. (Melbourne); James McRae, M.A. (Malvern, Victoria); Henry Robinson, M.D. (London).

Honorary Secretaries: George Simpson, M.B., M.R.C.P. (Melbourne); L. Dougal Callander, M.D. (Doncaster).

The Social Aims of Mental Hygiene.

Professor Harvey Sutton (Sydney) opened a discussion on the social aims of mental hygiene, with some general remarks on the "everyday problems of the everyday child" and on the part that could be played by the medical practitioner in the handling of these problems and on the situation and personnel of the ideal school guidance clinic.

Historically, the first writings on these problems had begun with the protests of Ascham and John Locke against the extensive use of corporal punishment for school discipline. Quite recently corporal punishment of schoolgirls had been discussed in *The British Medical Journal*. Compulsory education had largely discredited its use, except in a few limited breaches of the school rules. Encouragement, sound outlets for energy, and a better personal understanding between teacher and pupil obtained better results.

During the nineteenth century the control of bad habits had begun to come into the doctor's purview. A good example was the treatment of nocturnal incontinence when various physical measures had been attended with varying success. The value of suggestion, encouragement and understanding, together with a full social investigation of the home, could add to this success. A medical overhaul was essential in this and other behaviour problems, and the physician should have both pædiatric and psychiatric training, and should reinforce his efforts with the educational psychologist and the social worker.

Of all bad habits, masturbation was the best example of the failure of ignorance. The general public knew little of the physiological position as to sex. It was difficult to convince parents that even young children should be told the simple facts of life, and that natural curiosity should be met with simple truthfulness. Especially should the facts of their own sex be presented in a wholesome, correct fashion before early adolescence. Personal hygiene, outdoor sports and interesting occupations were of value.

Stammering was a constant problem in school life. In New South Wales, 1 in 40 boys and 1 in 120 girls showed speech defects. Little had been attempted of an organized

character to deal with this defect, yet personality and occupational development might be adversely affected. The modern development of classes and clinics provided the necessary atmosphere of success. Stammerers included five times as many left-handers as an ordinary sample of the population, and these were left-handers in which the attempt had been made to change them to right-hand writers under pressure or penalty. Not sufficient attention had been given to the mental associations of minor defects. Myopia might prevent the child taking part in games and foster the creation of a bookworm. Deafness, especially in one side only, was found far more commonly in a large group of incorrigible boys, and was the origin of misunderstanding and conflict with the teacher which led to truancy and defiance. The rapid reduction of the birth rate was producing an unfortunate increase in the number of one-child families, a difficult position for any child. Lack of playgrounds in the city was associated with delinquency.

In all these problems the parents, as controlling family and home, the units of human society, deserved consideration, and guidance clinics were designed to help them to solve their problems. The home was the laboratory of character, the parents were the executives, the doctor was the expert available for the anxious parent. Their best results would be obtained in the pre-school period of life, for adult fears and phobias so often arose in this garden of childhood. This was the age of habit development, including habit control of speech, of sleep, of bodily functions. In the first three years of life the brain increased to thrice its birth size, or three-quarters of its total growth. Rickets, affecting the stability of brain and body alike, was common. The medical contribution to the study of the origin and control of the many doubtful habits which might then develop was undoubted.

Within the same home different children might manifest different responses, perhaps due to biochemical stages or changes, endocrinal imbalance, allergic incompatibility and immunity developments. In school life the teacher, as the school doctor, might materially assist the parent, but in the pre-school period the family practitioner was all-important.

In conclusion, Professor Harvey Sutton discussed the organization of school guidance clinics. Education departments might attack certain aspects, as, for example, delinquency. Hospitals might establish clinics in their outpatient departments, but many parents did not wish to go near a hospital, and their children might not be of school age. Should private clinics be established, it was important that the head of the clinic should be a medical practitioner with wide sympathies, with a deep personal interest in children and the gift of handling them. The trio consisting of an experienced doctor, a trained educational psychologist and the trained health or home visitor seemed to be the ideal staff. These children could not be regarded as disembodied spirits any more than they should be treated as if they were merely animal bodies. Both attitudes were incomplete. Mind and body were inextricably interwoven and depended on one another.

DR. K. S. CUNNINGHAM (Chief Executive Officer of the Australian Institute of Educational and Vocational Research) said that the medical profession had to take the chief responsibility—the initiative—in the care of the problem child. The social worker had not yet reached the standard of training to command the full respect of the community. Probably all child guidance clinics were beyond the scope of the educational departments, but all children were in need of child guidance, and every teacher in his own sphere was conducting a child guidance clinic. A greater interest should be awakened in regard to the changing emotions, disordered habits *et cetera* of the school child. He would stress the care of the normal and of those who depart more or less from it. He would say that 40% or 50% of children had suggestions of some behaviour problem, some type of difficulty which needed special care and attention. Sex education provided a difficult problem. It was not an easy matter to decide when it should be done. Only the other day his own little girl, aged ten, had asked what was the white slave traffic. He had to confess that he found it extremely difficult to provide her with the answer.

MR. G. A. OSBORNE (Senior Inspector of the State Education Department) said that he was not a medical man, but an educationist interested in mental health and hygiene. He made sex education strictly taboo. No class of sex education was admitted to their schools, but might be given by a senior assistant teacher only at the request of the parent. He thought that corporal punishment had practically disappeared from schools, the reason being that a better understanding between teacher and child was definitely established, and this was good for the mental health of the pupil. In the Education Department stress was laid upon the part played by training and environment and the importance of the family life of the child. More should be done for the child in the pre-school age by the provision of kindergarten schools, nursery schools and by an additional number of trained social workers. In the special schools which the department had established for the mentally weak child, provision was made for two hundred pupils only. A weakness in the scheme was that there were insufficient social workers operating outside the schools to discover the children, and they were lacking in trained psychologists. If their children could get more special attention from the medical profession, they would do better. The school children were encouraged to take an interest in various clubs, for example, "League of Youth", scouting *et cetera*.

PROFESSOR J. A. GUNN (Melbourne) said that close cooperation was required between the medical man and the social worker. In this way progress would be made along the right lines. They had been told at the cathedral service by Bishop Hart that they must look at the whole personality. Anybody could call himself a psychologist, and the man in the street was hopelessly confused about the term. He would like to see training in psychology. The medical students were demanding more psychology in their curriculum, so that they might be better able to deal with communal problems. Many of the disturbances of personality had their origin in fear; others had a sex origin. During the War, so-called shell-shock was seen mostly in people who had had some previous shock in their childhood. When sex education had been neglected, it often gave rise to maladjustment in married life, with consequent domestic unhappiness, and most of this was due to ignorance. He could see no harm in teaching the child its relationship to the mother and, later on, the relation of the mother to the father.

DR. R. S. ELLERY (Melbourne) said that a movement which aimed at the conservation of a country's mental health must touch at some point or another every department of human activity, but ultimately it was true that, with the wiser training and understanding of children, much social pathology might be prevented. The teachings of Freud and others had in the last twenty-five years altered the outlook of people upon the criminal, and had shown the way to investigate the subconscious motives which were at the back of every criminal action. The duty of disciples of the mental hygiene movement was to endeavour to alter the country's attitude towards crime and punishment and to seek to find and cure the individual maladjustments which were conditioning criminal behaviour. There was need to deal in an enlightened and scientific way with the problem of juvenile delinquency. When a judge punished a criminal he was punishing something criminal in his own subconscious mind. Side by side with an alteration in the public's attitude to crime and punishment there must proceed an investigation into the causes of delinquency. Prevention of crime was a task centred in the study of the delinquent child.

DR. N. A. ALBISTON (Melbourne) said that a problem which was fundamental in medical sociology was the question of the family as an efficient social unit, and it involved all aspects of society. In Australia, where the family was at least nominally recognized, its status had been weakened by such social institutions as the nursery school, the kindergarten, and by such legal enactments as those relating to compulsory education, vaccination, health

inspection and its consequent remedial measures. The policy of child guidance clinics should be to conserve as far as possible the parent's capacity to deal with the problem.

DR. J. F. WILLIAMS (Melbourne) said that the psychiatric clinic at the Children's Hospital had been established by Professor Berry in 1925. The Wilson Trust assisted to finance the venture, which provided for the services of a clinician, a social worker, and a psychologist. During the financial depression funds were no longer available, and they were compelled to carry on with voluntary help. The work had steadily increased from seventy-five to two hundred new cases during the past year, a large proportion of the patients being mentally deficient children who had to be dealt with in some way or another. He wished to emphasize the lack of suitable institutions in the State for these children. The present position was touching only the fringe of the problem. The occupational or nursery school offered a very satisfactory solution for some children.

PROFESSOR W. S. DAWSON (Sydney) said that child guidance should remain within the ranks of the medical profession. The teaching given to students should have a biological background. In regard to mental deficiency, the public mind was inclined to attach too much importance to institutional care. Dull normals, by reason of their modified degree of intellectual failure, were unable to benefit by ordinary schools, and failure to make adjustments in the training of the class was responsible for their training in the community. He regretted to say that very little provision was made in New South Wales for this class of case.

MISS HYSLOP (Director of Social Training, Melbourne) said that many irregularities in a child's behaviour had their origin in emotional tension. The aim of the teacher was to "sell" the child to the parent by enlarging upon the better side of the child's character; this was more satisfactory than the teacher's handling the difficulty himself. Miss Hyslop stressed the importance of using trained social workers in this sphere, but anyone could call himself a social worker in Australia, as in England. The term "trained social worker" should not be allowed to be ambiguous.

DR. E. KAYE LE FLEMING (London) said that his contribution to the subject would consist of a few comments from his experience as a general practitioner who was interested in the medical care of boys in some of the great public schools. In regard to corporal punishment, he could say that he himself was brought up on it. He did not approve of its being administered at home, but he did not see how discipline could be maintained in a large boarding school without it. He felt sure that corporal punishment for girls was rarely carried out in England. It was still a difficult matter to explain nocturnal enuresis. He felt convinced that there was a developmental basis and possibly an endocrine factor in its ætiology. He agreed that there was little advantage to be gained in teaching children the structure of a daisy or a pansy as an approach to sex instruction. What they really desired to know were the facts relating to a man and a woman.

Professor Harvey Sutton, in reply, said that he was greatly disturbed by Dr. Albiston's views about the status of the family. He always thought that the influence of child guidance clinics and of public health measures, rather than weakening the family relationship, did exactly the reverse. The child guidance idea, being brought before the people, gave the impression that parenthood was important. The nineteenth century had indeed discovered the child, and he prophesied that the twentieth century would be responsible for the discovery of the parent.

Section of Dermatology.

President: S. Watson Smith, M.D., F.R.C.P., M.R.C.P. (Bournemouth).

Vice-Presidents: L. P. Johnston, M.B., Ch.M. (Sydney); Herman Lawrence, M.R.C.P. (Melbourne); J. E. McGlashan, M.C., M.B., B.S. (Perth, Western Australia); W. C. T. Upton, M.B., Ch.M. (Adelaide).

Honorary Secretaries: R. R. Wettenhall, M.B., Ch.B. (Melbourne); Alice B. Carleton, M.B., Ch.B. (Oxford).

The Incidence of Skin Conditions in Australia.

DR. HERMAN LAWRENCE (Melbourne) opened a discussion on the incidence of skin conditions in Australia. He said that he had endeavoured to get analyses to show the difference in the occurrence of skin affections at the skin clinics of England, America and Australia. He had limited himself to a consideration of the fifteen most commonly occurring diseases. He had found even in analyses of one thousand cases taken consecutively that the order of the fifteen varied considerably. The conditions included under the term eczema headed the list in all three countries. Next in order there was in Australia a class consisting of rodent ulcers, keratomata and epitheliomata; in England this class scarcely came into the first fifteen at all. In England, scabies, ringworm and pediculosis easily made the second class; in Australia they scarcely came into the picture of the fifteen most common. The difference, Dr. Lawrence thought, was due to a difference in social conditions. The Australian out-of-door life, the result of the temperate climate, was effective—the poorer classes lived in separate dwellings and had greater conveniences for personal cleanliness. In America acne appeared to take second place; this was a very common condition and ranked high in all three countries. America, like Australia, had few parasitic diseases as compared with England and Scotland. *Lupus vulgaris*, one of the *bête noire* diseases of the skin in the British Isles, was quite rare in Australia and America, and in both these countries it was mild and fairly amenable to treatment.

Dr. Lawrence then passed on to a detailed discussion of keratoses, favus, *dermanyssus avium et gallinæ*, and dermametropathism. He concluded with a short account of some electronization experiments upon the metamorphosis of insect life.

DR. W. C. T. UPTON (Adelaide) said that roughly one patient in every eight had rodent ulcers or keratoses or both. Of these patients, 40% were elderly women who had never used powder or face cream. The great amount of sunshine and low relative humidity of South Australia accounted, in his opinion, for the prevalence of the above conditions. He therefore thought that it was hardly desirable for people living in the interior of South Australia to protect their skins. He was rather surprised that there were not more cases of *hydroa æstivale* and *xerodermia pigmentosum*. He asked Dr. Lawrence whether he had noted any cases of *lupus erythematosus* following acute sunburn. He had obtained a definite history of this kind in five out of twenty-five cases. Was the condition known as grain itch? This condition was due to a small parasite, the *Pediculoides ventricosus*, and usually occurred in those engaged in chaff-cutting.

DR. F. H. MAKIN (Adelaide) said that he was associated with the cancer clinic at the Adelaide Hospital. A recent analysis of three thousand cases of cancer of both internal

and external types showed that in approximately two thousand of these cases the condition was some form of keratosis or cancerous lesion of the skin. For the treatment of keratoses he preferred the use of deep X ray therapy to radium, particularly when multiple lesions were present. Tinea of the feet and also dhobie itch were common and were becoming more common. *Tinea capitis* was rare. Scabies was not frequently seen, but in the last two years had become more prevalent.

Dr. J. M. A. O'Donnell (Perth) said that conditions in Western Australia were very similar to those found in South Australia. Keratoses were so common that they were popularly termed goldfields skin. He recommended that colourless lipstick should be used as a preventive measure. Plant sensitization was a common source of trouble in the spring, due to dandelion, and in January to stinkwort. *Tinea capitis* was very common, mainly of the tricophyton type, and he used thallium acetate for treatment.

Dr. J. Witton Flynn (Sydney) suggested that ringworm infections were more common than Dr. Lawrence had stated. For the protection of the upper lip he would suggest that outdoor workers should grow a moustache.

Dr. J. H. Kelly (Melbourne) said that in his experience sunburn was the precipitating factor in the majority of cases of *lupus erythematosus*. *Lupus vulgaris* was very uncommon in the native born, probably owing to the protecting action of ultra-violet rays. Syphilis was a rarer disease than formerly. He would deprecate the use of deep X ray therapy for keratoses; if deep therapy was used, one was using actinic rays to cure a lesion caused by actinic rays. Therefore the areas around the lesion to be treated should be sharply screened off. He preferred the use of radium.

Dr. Watson Smith (Bournemouth) recognized the necessity for charting diseases in different countries. A commencement had been made in Great Britain in some of the counties. In Great Britain keratoses were regarded as potential malignant conditions, and although he believed the exciting cause to be actinic rays, the relative low humidity was a definite predisposing factor. Favus was unknown in England, but common in Scotland, where it was believed to have been introduced by Polish Jews brought to work in the mines.

Dr. Lawrence, in reply, said that he frequently found that *lupus erythematosus* followed sunburn. In an experience of over 80,000 cases of skin disease he had never seen in Australia a case of *xerodermia pigmentosum*. He regarded the use of deep X rays for the treatment of keratoses as somewhat like using a sledge hammer to crack a nut. He preferred his "wavical collision value", using β particles. He exposed the lesion for twenty minutes to intense β radiation and then added high frequency for four minutes. He had had keratoses of his own successfully treated by this method.

Staphylococcal Infections of the Skin.

Dr. J. Ivan Connor (Melbourne) opened a discussion on staphylococcal infections of the skin and their treatment. He said that the following conditions had been shown to be due to staphylococcal infection: *sycosis coccygenia*, *sycosis nuchæ*, recurrent furunculosis, carbuncle, blepharitis, *acne necrotica*, hydradenitis (axillary abscess), pyogenic granuloma, *acrodermatitis continua*, porofolliculitis (Bockhart's impetigo), *dermatitis infectiosa eczematoides*, onychia and paronychia, multiple subcutaneous abscess of infants, *pemphigus neonatorum*, *miliaria rubra*. The type of the lesion was determined by circumstances—the age and state of health of the patient, the site of the initial infection, and the subsequent treatment. The infections tended to remain pure or text book in type. The explanation of this might be that different strains of the organism were responsible for the differing types of infection.

After reference to the conditions which might predispose patients to these conditions, Dr. Connor said that the treatment of many of them might be simple and followed the usual lines of attention to the general health by proper diet and exercise, with the local application of mild superficial antiseptics, of which every medical practitioner had his favourites. If the infection did not respond to simple measures, other remedies were necessary. Dr. Connor gave a long list of the different remedies that were used, and said that their multiplicity suggested that none of them could be relied upon to promote recovery in obstinate cases.

Dr. Connor then traversed recent work on staphylococci, their different strains, toxins and antitoxins. He then said that the exotoxin of the staphylococcus, which was lethal if injected in the crude state, might be robbed of its dangerous properties, but be allowed to retain its useful immunizing properties by incubation for several days after the addition of a small percentage of formalin. The product thus obtained was known as a toxoid, and had been used in the treatment of chronic staphylococcal infections. By a graduated series of injections it was possible to increase the amount of circulating antitoxin in the blood of human beings and animals, even to twenty times the original titre. This increase of antitoxin was accompanied by immunity in animals and improvement in the clinical condition of human beings in a moderately large percentage of cases. Dr. Connor had chosen a series of patients suffering from *sycosis barbæ* (the most intractable of these infections) because the patients had resisted all previous attempts at cure, and the majority gave a history of infection for several years. He had also treated patients with other conditions. His practice with the earlier patients had been to use a polyvalent toxoid, to begin with small injections of 0·05 cubic centimetre and to increase the dose cautiously at intervals of a week. His experience agreed with that of Dolman and Murray, that the patient's condition and response were sufficient guide to the dosage and frequency of the injections. In his experience, eight injections had sufficed to cure cases of recurrent furunculosis, but patients with *sycosis barbæ* required a long course of treatment—up to forty injections—to produce a cure. Of twenty-three patients with *sycosis barbæ* treated with injections of toxoid, twelve might be regarded as cured and the remainder as much improved, so much so that they had ceased to attend the out-patient department. Dr. Connor set out in a table the results of the other conditions which had been treated with toxoid. He said that cases of seborrhœa with added staphylococcal infections still retained the tendency to seborrhœic manifestations when the staphylococcus had been dealt with. The same applied to acne.

Dr. F. T. Morgan (Melbourne) said that Dr. Connor had drawn attention to the likely influence of differences in toxins of infecting staphylococci upon the nature of the clinical response to immunization. He (Dr. Morgan) had been engaged for several years upon the production of toxins of the staphylococcus upon artificial media. These toxins were used to immunize horses to produce protective serum. A method of classification of staphylococci according to their toxins which acted as antigens had already been employed by him, and the findings were about to be published. There was no apparent reason why, given the correct immunizing agent, a considerable degree of acquired immunity might not be developed by the injection of toxoid with beneficial clinical results in a large percentage of staphylococcal infections.

Dr. E. H. Molesworth (Sydney) said that he thought there was confusion of nomenclature regarding blepharitis. He did not believe that the ordinary case of blepharitis was due to the staphylococcus, but was a manifestation of seborrhœa. Sycosis was often difficult to eradicate, even when complete epilation was carried out. Not all patients with sycosis had seborrhœa, and he did not believe that seborrhœa was a predisposing cause of sycosis. For example, moustache sycosis originated in nasal secretion. He had found antivirus of value in the treatment of staphylococcal infections. The toxoid evolved by Dr. Connor provided a necessary new therapy for the treatment of staphylococcal infection.

Dr. A. G. Butler (Canberra) recalled the prevalence in the Australian troops on Gallipoli and in Palestine of the condition known in Queensland as "the Barcoo rot", from

the name of an outback district. The name "Barcoo disease" was accepted by the British Medical Research Committee as official for war statistics. Lieutenant-Colonel (later Sir) Charles Martin had shown that this intractable superficial spreading ulceration (probably identical with "veldt sore") was due to infection of the hair follicles with staphylococci of low effective virulence. Treatment by epilation and weak antiseptics usually produced a tedious cure. But if this was combined with a free diet containing fruit and vegetables the disease was much more readily checked. The cause was essentially twofold—staphylococcal infection in a dirty skin and specific dietetic deficiency.

Mycological Infections.

Dr. John C. Belisario (Sydney) opened a discussion on mycological infections and their treatment. He began by saying that vesicular eruptions of mycotic origin on the feet and hands were frequently seen and might prove extremely rebellious to treatment. He described several clinical varieties. The first was the superficial vesicular type. The second was the more deeply seated vesicular eruption; in this variety the size of the vesicles varied from pin point and sago grain size up to large bullæ, produced by the confluence of many vesicles. The third variety was the scaling or eczematoid type, in which clusters of vesicles were found at some stage or other, principally in the eruptive stage. This type Dr. Belisario had found the most resistant to treatment. The fourth was the intertriginous, and the fifth was the hyperkeratotic or verrucose type.

Dr. Belisario discussed the ætiological factors. He pointed out that warm weather exerted an aggravating effect which produced seasonal recurrences. The condition was found more commonly in men than in women; and it was seen mainly during the period of greatest activity and of possibility of exposure to external irritants. He named certain predisposing factors and said that he believed that the explanation of all the factors lay to a great extent in the composition of the individual's sweat. It had been shown that the sweat of the glabrous skin had a pH value varying from 3·5 to 5·5; this was largely due to evaporation, the natural acid reaction of the horny cells and the sebaceous gland reaction, as sweat alone was neutral or faintly alkaline. When the continuity of the keratine layer was broken evaporation was delayed. It was likewise delayed between opposing skin surfaces, and the natural acid-protecting cloak of the skin in these areas verged towards the alkaline side. The sweat of the palms of the hands and soles of the feet had been found to be neutral or frankly alkaline. It seemed logical to consider that this was due to the absence of sebaceous glands, and also, in the case of the feet, to prevention of evaporation. Dr. Belisario referred to recorded observations on the sweat in relation both to staphylococci and fungi, and said that these, together with his own experience of the alkalinity of vesicles produced by fungi, pointed strongly to the assumption that the predilection of mycological infections for the palms and soles was due to the alkaline tendency of the sweat in these areas.

In regard to treatment, local treatment was mainly directed towards mildly acidifying the affected parts with fungicidal medicaments. The pH value of the commonly used preparations had been shown to be less than 7·0, and one of the immediate actions of X rays and ultra-violet rays was to increase temporarily the acidity of the tissues. Boric acid, possessing buffer qualities, seemed ideal, but it soon lost its effect. The effect of acids, such as hydrochloric, lactic, tartaric and carbolic, was due rather to their molecules than to their hydrogen ion content, and they tended to become irritating. Dr. Belisario had found lemon juice very useful. He instructed his patients to bathe the affected parts in hot water to which subacetate of lead had been added. Then they applied ammoniated mercury in lanoline. They ruptured the vesicles and rubbed in lemon juice. In the later stages, when a certain amount of eczematization had supervened, the lemon juice was diluted or dispensed with and weak tar or ichthyol and salicylic acid preparations were then applied. These applications were supplemented, if necessary, by the use of X rays. Other applications which he had found most beneficial were weak perchloride of mercury baths in the acute stages, followed by weak salicylic acid and tar or ichthyol ointments, assisted by fractional doses of X rays. He had found X rays to be almost infallible in the temporary alleviation of the condition. Curettage of the toe interspaces twice weekly was of material assistance. The elimination of all infected foci, such as nails, should be attempted. Other toxic foci, such as infected teeth roots or tonsils, should be removed, as this procedure would sometimes help to eradicate the condition when eczematization was a marked feature. Intravenous injections of calcium, combined with X rays, often produced good results. High colon lavage would produce good results in some chronic eczematous cases.

Dr. J. Witton Flynn (Sydney) said that recent investigations of his had convinced him that in Sydney 60% of the population were infected with tinea, but of this number 10% of the infections were symptomatic and 50% asymptomatic. Fifteen years ago tinea of the feet had been found mainly amongst the more leisured classes; the condition was contracted at country clubs and golf courses. At present the whole community was involved. Surf houses were hotbeds of infection. Men were infected to a much greater degree than women. He thought this was due to women being more careful about running about in public places bare-footed and to their use of silk stockings, which inhibited "sweaty feet".

Dr. A. G. Butler (Canberra) spoke of his experience with extensive outbreaks of epidermal mycosis among the cadets at the Royal Military College, Duntroon. The incidence was as high as 90%. The disease affected chiefly the toes (interdigital clefts and nails), thighs and groin; but he had seen cases of *pruritus ani* which he believed to be due to fungoid infection. Very strict measures were required to stamp out the visible infection; and the fungus itself proved in many cases irradicable by ordinary measures. Dr. Butler had relied for treatment on antiseptic lotions (permanganate of potash, formalin and mercuric chloride) and on dusting powders (boric acid and boro-chloretone). Whitfield's ointment had not been found a satisfactory medium for treatment in the cadets.

Dr. S. W. Shields (Melbourne) said that possibly the increase might be partly due to recent increase in dermatological knowledge. A high proportion of people, especially in warmer climates, had a latent tinea infection.

Dr. M. R. Healy (Melbourne) drew attention to the resemblance between tinea feet, *acrodermatitis perstans*, and pustular psoriasis. He found X rays of no use in the treatment of tinea of the feet; but they were of value for *acrodermatitis perstans* and pustular psoriasis.

Dr. S. Watson Smith (Bournemouth) said that in Great Britain tinea infections were very common in boys' boarding schools. Dr. Belisario had made no mention of the use of various aniline dyes in treatment; these had been found most useful in Great Britain. A diagnosis of tinea should never be made without a microscopic examination.

The Pathological Museum.

The Museum Committee, of which Professor F. Wood Jones was Chairman and Dr. E. S. J. King was Honorary Secretary, had arranged a series of specimens illustrating the work of the Sections and other objects, peculiarly Australian, which were thought to be of interest to overseas visitors. The museum was located in the Anatomy School; the specimens were beautifully set out, and by means of a carefully compiled catalogue visitors were able

to study the specimens in their proper sequence. The attention of visitors was directed especially to exhibits of hydatid disease, of Australian snakes and their venoms, and of Australian marsupials.

During the course of the meeting demonstrations were conducted as follow: "Virus Disease and Bacteriophage", Dr. F. M. Burnet; "Hydatid Disease", Professor H. R. Dew; "Fluorescence Microscope", Dr. E. S. J. King; "Australian Snakes and their Venoms", Dr. C. H. Kellaway; "Tuberculosis", Dr. E. L. Cooper; "Anaerobic Infections and Laboratory Tests for Syphilis", Professor H. A. Woodruff; "Australian Marsupials and Skulls", Professor F. Wood Jones; "Brain Tumours", Dr. L. B. Cox; "Bone Disease", Professor P. MacCallum; "Tænia Saginata", Dr. H. B. Penfold.

The Trade Exhibition.

The Trade Exhibition Committee, of which Dr. R. H. Fetherston was Chairman and Dr. C. H. Dickson Honorary Secretary, had at its disposal space in the Department of Anatomy, in the Department of Architecture and in adjacent corridors. Measured amounts of space were allotted to the various exhibiting firms. The following is a list of the exhibitors with some indications of the goods displayed.

W. Watson and Sons, Limited, showed a wide range of modern X ray and electro-medical apparatus. Included in the display was a small shockproof portable X ray unit and an X ray tilt table embodying all necessary movements and accessories for modern radiographic and fluoroscopic procedure. Particular attention was drawn to the inductotherm, for the generation of heat within the tissues by electro-magnetic induction, and to the modern actinotherapy equipment.

Felton, Grimwade and Duerdins, Limited, displayed a "D.H.A." operating table, fitted with a Quervain base and Hahn top, and with an oil pump, designed to facilitate lifting or lowering of patients and the adoption of any desired position. The "Junior Table" of the pedestal type was also shown.

Walker Laboratories Proprietary Limited, Kraft Walker Cheese Company Proprietary Limited and Fred Walker and Company Proprietary Limited displayed several products on their stand. Prominence was given to Walker Laboratories Liver Extract. This extract, for oral use, was the fraction G of Cohn and represented 4% of the weight of fresh liver; it was packed in four-gramme phials, each representing one dose. Other products displayed included "Vegemite", a concentrated yeast extract containing vitamin *B*, "Kraftine", a vacuum dried milk, malt and egg drink, also "Bonox".

Colman-Keen (Australasia) Limited displayed Robinson's "Patent" Groats, regarded as being suitable for nursing mothers, and Robinson's "Patent" Barley, in sealed packages to lessen the likelihood of contamination.

Reckitt's (Over Sea) Limited, Pharmaceutical Department, displayed "Dettol", a new non-poisonous, non-corrosive antiseptic, which has a Rideal-Walker coefficient of 3·0, and which is miscible with water in all proportions. "Dettol" Obstetric Cream, containing 30% "Dettol" in gum tragacanth, intended for midwifery purposes, was also shown.

Chemical Works (formerly Sandoz), Basle, Switzerland, displayed "Bellergal", "Calcibronat", "Digilanicl" and "Quinine Calcium Sandoz".

May and Baker, Limited, had an extensive display. "Novarsenobillon" and "Metarsenobillon" were shown in ampoules and double ampoules. "Tryparsamide" was also shown in ampoules and double ampoules. Local anæsthetics included "Planocaine" ("Procaine") and "Scuroform". "Ametox" (sodium thiosulphate), "Opacol" (sodium tetraiodophenolphthalein), "Neptal" (mercuramide), acriflavine and euflavine were shown. Hypnotics and sedatives included "Soneryl", "Sodium-Soneryl", "Gardenal", "Sodium-Gardenal", "Theogardenal". Other drugs included "Pragmoline", ephedrine (alkaloid, sulphate and hydrochloride), "Neo-Cardyl" (bismuth butylthiolaurate), "Crisalbine" (gold sodium thiosulphate), "Myocrisin" (sodium aurothiomalate), "Ergometrine".

Schering-Kahlbaum (Australia) Limited displayed several drugs, including the following: "Neotropin", a genito-urinary disinfectant; "Progynon B Oleosum", a dihydro-follicle hormone preparation; "Solganol B" (aurothioglucose); and "Veramon" (analgesic and sedative).

Rocke, Tompsitt and Company Proprietary Limited had a working exhibit showing the manufacture of "Livrox" into tablets; "Livrox" is manufactured from dehydrated ox livers. The following drugs were also shown: "Elixir Ferrox", "Anticalor", "Roctoco", "Roctocaine", "Serol", "Cas-a-lax", "Ethereal Antiseptic Soap", "Nazol".

Alfred Nott Proprietary, Limited, showed spectacle and eyeglass frames and mountings of modern design, and also the various types of lenses used in the manufacture of spectacles. They also showed orthoptic training instruments of their own manufacture.

N. H. Seward Proprietary, Limited, had an interesting display of microscopes and accessories, scientific and surveying instruments and Australian opals. In the microscope section the firm showed the latest high power binocular microscopes made by Leitz (Wetzlar) and Seibert (Wetzlar) and also a new eyepiece camera, made by Seibert, which fits into the microscope. Included in the range of scientific instruments was a mains transformer for running diagnostic instruments directly off the mains, also a plandle to simplify their handling. Other items of interest were the Takonta Automatic Registration Pencil for use in blood cell differentiation, and the Neubauer-Buerker hæmocytometer.

The Commonwealth Serum Laboratories displayed a wide range of biological products, principally sera, vaccines and certain preparations from the endocrine glands. Among the sera were those more commonly used, such as diphtheria antitoxin, tetanus antitoxin, antistreptococcal serum and gas gangrene antiserum. Also included were anti-anthrax serum, antidysenteric serum, antigonococcal serum, antimeningococcal serum, antipneumococcal serum, antistaphylococcal serum, normal horse serum and tiger snake antivenene. Among the vaccines were the following: *Bacillus coli*, acne, *Bacillus dysenteriæ*, cholera, Coley's fluid, coryza, diphtheria bacillus, Dreyer's, gonococcus, influenza bacillus, pertussis, plague, pneumococcus, staphylococcus, streptococcus and typhoid. Among the endocrine products were insulin, pituitary extract and thyreoid tablets. Extracts for the diagnosis of hay fever, asthma and other allergic conditions were also shown. Included in the exhibit were glycerinized calf lymph for use against smallpox, tuberculin (old), certain bacteriological media and clinical diagnostic outfits.

H. B. Selby and Company Proprietary, Limited, had a display of laboratory glassware, scientific apparatus and chemical reagents. They also showed Reichert stereo-binocular microscopes and accessories.

The Tasmanian Government Tourist Department had a stand, supplied with literature about the island; an officer of the department was in charge to give information about travelling facilities and so forth.

Carl Zeiss, Jena, and Zeiss-Ikon, Dresden, represented by Messrs. E. C. Heyne Proprietary, Limited, exhibited scientific and optical instruments, field glasses and cameras. Carl Zeiss products included microscopes and magnifiers of latest constructions, optical measuring instruments, and lamps for various surgical purposes. For oculists, the Comberg slit lamp, the small vertex refractionometer, the telescopic spectacle trial case and the contact lenses were exhibits of particular interest. Cameras from Zeiss-Ikon included the miniature camera "Contax", which is easily adapted for various branches of scientific photography, including clinical work, microscopic and X ray photography.

Allan Grant showed a number of medical books and some surgical apparatus, including the British Accoson Standard Mercurial Sphygmomanometer and Gabriel's Hæmorrhoidal Syringe.

Australian and Overseas Travel Service Proprietary, Limited, had a stand at which information was given about the organization of travel tours overseas.

David G. Bull showed a series of "Hermette" products: "Hermette" Bee Venom; "Hermette" Pituitary Extract, anterior and posterior lobes; "Hermette" Corpus Luteum; "Hermette" Ergot; "Hermette" Quinine Urethane; "Hermette" Colloidal Manganese; "Hermette" Emetine Hydrochloride; Liver Extract and Glandular Products (Bull).

Eli Lilly and Company showed a wide range of products. These included the following: "Amertan, Lilly"; "Amytal" and "Amytal Compound, Lilly"; "Carbarsone, Lilly"; "Carbarsone Suppositories, Lilly"; "Ephedrine Sulphate, Lilly" in ampoules, pulvules, jelly, solution and syrup; "Pulvules Ephedrine and Amytal, Lilly"; "Inhalant Ephedrine Compound (and Plain), Lilly"; various ephedrine and merthiolate preparations; "Insulin, Lilly", "Oxyl-Iodide, Lilly"; "Para-Thor-Mone, Lilly".

Oppenheimer, Son and Company, Limited, displayed numbers of their preparations. They gave prominence to their "Bipalatinoid Iron", bipalatinoids being small biconvex cachets of soluble glycerine jujube, each divided into two compartments by a partition of the same material. Stress was also laid on "Roboleine" and the "Oppenheimer Aerizer". Other products shown included: "Acetosal"; "Alphidine"; "Balmosa"; "Cocoids", small pastilles of pure milk chocolate into which various medicaments were placed; "Grindelene"; "Oscols"; "Palatinoids"; "Pinheroin"; "Unguentum Renaglandin Anæsthetic"; and "Vitad".

W. Ramsay (Surgical) Proprietary, Limited, showed a collection of medical books and surgical instruments, including Böhler's fracture appliances, Leitz microscopes, electric diagnostic sets and Davis and Geck's sutures.

The Lancet, Limited, displayed the journal *The Lancet*, together with "The Lancet Extra Numbers", "Clinical Interpretation of Aids to Diagnosis", "Modern Technique in Treatment" and other volumes.

The Continental Drug Company, Limited, Karna Vita Company, Limited, and H. Hanna and Company Proprietary, Limited, showed such preparations as "Tricalcine" in its various forms, "Peptalmine", "Uraseptine" by Rogier, "Quinby", "Santal Monal". "Karna Vita", desiccated ox liver, was shown both plain and with confection, as well as plain liver and liver and iron tablets in an attractive form.

The Bowker X-Ray Company Proprietary, Limited, displayed the Bowker "Universal" X ray apparatus, combining high tension transformer, control unit, tilting table, Bucky table, upright Bucky stand, counterbalanced tube stand, vertical and horizontal fluoroscopic unit, teleradiographic unit, urological fluoroscopic and Bucky unit and examination couch.

Glandular Preparations, Limited, displayed "Hepasol inj", an injectible liver extract for intramuscular use; "Hepasol liq.", for oral use; "Hepasol with Iron", "Gynex" and "Genifort", glandular compound tablets.

Alfred Lawrence and Company, Limited, showed "Poulticine", a cataplasma kaolini; "Neozone", a preparation containing 40% eucalyptus oil in soluble form; an adrenaline chloride solution; "Milalco", milk of magnesia (Lawrence); "O-Dene", an iodine ointment; and galenicals.

Parke, Davis and Company had a comprehensive display of their products, chief among which were the following: "Adrenalin"; "Pituitrin"; "Abidon Capsules", containing vitamin *B*; "Halivol", a halibut liver preparation; "Irradol-A"; "Hebaral Sodium"; "Gonococcus Filtrate"; "Diphtheria Toxoid", alum precipitated; "Pertussis Vaccine"; "Meningococcus Antitoxin"; "Antuitrin-S", the sex hormone; "Theelin", ovarian follicular hormone; "Eschatin", extract of the suprarenal cortex; "Antuitrin-G", the growth hormone.

Kodak (Australasia) Proprietary, Limited, showed a complete range of radiographic and photographic supplies. Supplies for medical radiography included "Kodak Ultra-Speed Dupli-Tized Safety Blue Base"; "Eastman Cardiographic Film"; "Kodak Tested Chemicals"; "Kodak X-Ray Illuminator". Supplies for dental radiography included "Eastman Radia-Tized Dental X-Ray Film", "Eastman Dental Safety X-Ray Film", "Eastman Bite-Wing Dental X-Ray Film", "Eastman Dental Film Dispenser and Receptacle". For clinical photography the "Eastman Clinical Camera Outfit" was shown. Data and apparatus in connexion with clinical cinematography were shown and the Kodak Medical Film Library was demonstrated.

Evans, Sons, Lescher and Webb, Limited, showed many pharmaceutical products. Foremost among the exhibits was the "Hepatex" series, comprising "Hepatex Oral", "Hepatex P.A.F." for intravenous injection, and "Hepatex I.M." for intramuscular injection, also "Hepatex Compound Intramuscular" for secondary anæmia, together with "Hepovite", a compound elixir of liver with iron and glycerophosphate. "Colliron", a colloidal preparation containing 10% of iron with a trace of copper, was demonstrated. The range of ephedrine preparations comprised "Ephretuss" for whooping cough, "Ephrelix" for bronchial asthma, "Ephresol", an oily solution for use with the nasal spray, and "Ephregel", a nasal jelly useful for hay fever and nasal catarrh. Other products displayed were: "E.D.P." (Evans' Dusting Powder), a medicated dry dressing, containing bismuth, formol-iodide, for treatment of superficial wounds, eczematous conditions *et cetera*; "Collozin", a colloidal zinc hydroxide; "Collumina", a colloidal aluminium hydroxide for the treatment of gastric inefficiency and hyperacidity of the stomach; "Eubion", a vitamin *A* concentrate, issued in the form of a moulded chocolate tablet; Midgley's soaps, comprising many formulæ, the most useful ones being No. 18, sulphur and β naphthol, for acne, and No. 19, sulphur, camphor and balsam of Peru, for psoriasis, eczema and scabies; "Evans Antiseptic Throat Pastilles" and "Cardatone", a cardiac stimulant, were shown. The firm also exhibited a series of their gland preparations made from fresh glands direct from their own farm, and displayed a number of chemicals manufactured at their fine chemical works at Ellesmere, Cheshire.

Philips Lamps (Australasia) Limited displayed the products of the X ray laboratories of Philips "Metalix" X-Ray, Holland. The new shockproof rotating anode tube, "The Rotalix", occupied pride of place and was supported by examples of the "Standard 2·5 Shockproof Mobile X-Ray Unit", the "Centralix 50" for dental X ray work, and the new Mercury Vapour Rectifying Valve, type G 125, for a thousand milliampères. It was pointed out

that "The Rotalix" was important through its ability to deliver highest power radiation through a focal spot of 1·2 millimetres square.

Nestlé and Anglo-Swiss Condensed Milk Company, Limited, displayed their "Vi-Lactogen" with added vitamins *A* and *D*. It was explained that the addition consisted of a concentrate of vitamins *A* and *D* of natural origin (selected fish liver oils).

British Pharmaceuticals Limited had a display of interesting products. They showed "Edwinil" (Spicer). On behalf of W. Martindale, London, they showed "Aspriodine", "Ether Soluble Tar Paste", "Baban" (rectal), "Lobelin". On behalf of Abbott Laboratories Limited, Canada, they showed "Nembutal" and "Metaphen". On behalf of W. Mather Limited, Manchester, they showed plain adhesive and elastic plaster made by the "Calender" process.

Glaxo Laboratories showed "Ostelin Liquid" and "Ostelin Tablets", for rhachitic and other conditions associated with defective metabolism of calcium and phosphorus. They showed "Adexolin Liquid" and "Adexolin Capsules", for the prophylaxis and treatment of epithelial infections; "Ostomalt"; "Colloidal Calcium with Ostelin"; and "Glucose-D", a pure medicinal powdered glucose reinforced with calcium glycerophosphate and vitamin *D*. A new iron preparation was also shown—"Minadex", a modern adaptation of *Syrupus Ferri Phosphatis Compositus* and cod liver oil.

Burroughs Wellcome and Company (Australia), Limited, had a complete and interesting display of their products. "Wellcome" Insulin was shown, also a preparation of ergometrine, the alkaloid of ergot. Several preparations of ergometrine for administration by mouth and by injection were shown, together with "Ergotoxine Ethanesulphonate". "Digoxin", a pure, stable, crystallized glucoside, isolated from the leaves of *Digitalis lanata*, was exhibited. "Tannafax", a preparation for the treatment of burns and scalds, consisted of tannic acid in a water-soluble base. Several preparations for use in leprosy were to be seen, and organic arsenic and bismuth preparations were shown as examples of spirillicides. Numerous "Tabloid" brand products were exhibited. "Kepler" cod liver oil with malt extract was shown as a dietary adjunct, containing vitamins *A*, *B* and *D* in the natural association. A comprehensive array of "Tabloid" chests and cases, "Tabloid" hypodermic pocket cases and hypodermic apparatus was included.

Stanford X-Ray and Radium Proprietary, Limited, had an interesting range of X ray and electro-therapeutic equipment. They showed the Siemens Portable Shockproof X-Ray Sphere, in which the high tension transformer and tube are enclosed in a spherical-shaped housing about 22 centimetres in diameter. They also showed the "Universal Portable or Mobile Unit", the "Diagnostic Single Valve Rectified Unit", the "Quadrex Four Valve Rectified Unit", the "Siemens Short and Ultra-Wave Apparatus", the "Siemens Electro-Cardiograph" and a range of accessory supplies.

Dunlop Perdriau Rubber Company, Limited, showed "Dunlopillo" bed and operating table mattresses, "Dunlopillo" cushions, ear and ulcer syringes, *post mortem* and surgeons' gloves, surgical bandages, air cushions, hot water bags, a combination air cushion and bed pan, rubber aprons, surgical pressure and stethoscope tubing, "Duperite" plastic mouldings and rubber matting.

Bayer Products Limited exhibited an interesting range of pharmaceuticals. This exhibit included "Campolon" (for pernicious anæmia intramuscular administration), "Prolan" (anterior pituitary), "Unden" (ovarian hormone preparation), "Butolan" (anthelmintic), "Lacarnol" (*angina pectoris*), "Salvarsan" (Ehrlich's original "606"), "Neosalvarsan" (Ehrlich's original "914"), "Phanodorm" (hypnotic), "Evipan" (somnifacient, extremely rapidly detoxicated), "Evipan Sodium" (for short anæsthesia, administered intravenously), "Icoral" (analeptic for cardiac and respiratory failure), "Decicain" (local anæsthetic), "Luminal" (original brand of phenyl-ethyl-malonyl-urea), "Novocain" (local anæsthetic), "Devegan" (vaginal tablets for leucorrhœa), "Festal" (pancreatic enzyme), "Elityran" (standardized extract of natural thyreoid), "Prominal" (antiepileptic exhibiting typical "Luminal" action with reduced hypnotic effect), "Theominal" (high blood pressure.

Petrolagar Laboratories, Incorporated, displayed their range of different "Petrolagar" combinations for the treatment of constipation. "Petrolagar" is an emulsion of 65% (by volume) mineral oil with the indigestible emulsifying agent agar-agar. The five combinations displayed were as follows: No. 1, "Petrolagar Plain", No. 2, "Petrolagar with Phenolphthalein", No. 3, "Petrolagar with Milk of Magnesia", No. 4, "Petrolagar Unsweetened" (for diabetics), No. 5, "Petrolagar with Cascara".

New Zealand Government Tourist and Trade Bureau had a stand at which information was given regarding travel facilities in the Dominion.

Angus and Robertson, Limited, had a stand at which they showed a wide range of English and American medical and surgical books and Australian books of general interest.

The Dried Fruits Joint Publicity Committee had a display of sun-dried fruit, hygienically prepared and packed under strict governmental supervision.

"Sanitas" X-Ray Equipments displayed some of their new X ray and electro-medical apparatus. The "Undala Ultra Short Wave Therapy Apparatus" was shown in three different models: "Simplex" for the requirements of general practice, "Extra" for medical treatment and electro-surgery, "Dux", with a particularly high output, for use in hospitals and by specialists. It was pointed out that the "Undala" operated on a variable wave length of from six to sixteen metres. A new "Shockproof Portable X-Ray Apparatus" was shown. The "Tomograph" was demonstrated; it was claimed that with this apparatus it was possible "to divide the lungs into layers and to examine radiographically each separate layer for any pathological changes".

The Gas Companies' Association of Australia had a stand at which the uses to which gas might be put in medical laboratories and in hospitals were demonstrated and explained. Fittings for medical laboratories included water stills, gas refrigerators, sink heaters, steam baths, hot air ovens, biological incubators, sterilizers, water baths, burners *et cetera*. Fittings for hospitals included radiation clinical lamps, gas fires, sink heaters, hot water systems, hospital sterilizers, gas towel rack dryers, heavy duty gas cookers.

The Solus Electrical Company showed X ray units of the shockproof order, non-shockproof single valve and portable sets and other accessory apparatus.

The Victorian Railways Department had a stand at which information and literature regarding travel in Victoria were obtainable.

Berlei Limited displayed corsets and surgical supports of various kinds.

The Anæsthetic and Portable Machines Company displayed portable electrically operated anæsthetic machines, portable electrically operated suction apparatus, operating theatre vaporizing units. With "Model V.U.P.S. Anæsthetic Apparatus" it was possible to maintain efficient suction simultaneously with the administration of an anæsthetic; the suction being operated from an independent pump, it was claimed that no infection would be transferred from one patient to another.

F. H. Faulding and Company, Limited, displayed "London Hospital Catgut", "Pernaemon Forte" and "Faulding" medical specialties.

The British Drug Houses (Australia), Limited, displayed a wide range of medical specialties. They showed

"Ergometrine B.D.H.", the water-soluble alkaloid of ergot; "Ergodex", a stable and miscible liquid preparation containing standardized quantities of both ergometrine and ergotoxine; "Oestroform" and "Oestroform B", preparations of the ovarian follicular hormone; "Progestin", the standardized hormone of the *corpus luteum*; "Acetylcholine B.D.H.", used in the treatment of paralytic ileus; "Glycine B.D.H.", used in *myasthenia gravis* and progressive muscular dystrophy. In addition to vitamin products, such as "Radio-Malt", "Radiostoleum" and "Ovoleum", they showed "Crystalline Vitamin C" ("Ascorbic Acid B.D.H.") and "Calsimil", containing calcium sodium lactate and standardized amounts of vitamin *D*.

James Bell, Machinery Proprietary, Limited, showed "Lai-Cure", a "cultured acidified skim-milk in powder form containing lactic acid producing bacillus".

Oxford University Press had a display of Oxford medical publications.

The Age, daily newspaper of Melbourne, was displayed in an attractive fashion.

The Woolwich-Elliott Chemical Company displayed their ether for anæsthesia and their ethyl chloride.

Cadbury-Fry-Pascall Proprietary, Limited, had a stand to display the properties of "Bourn-Vita". In the literature connected with the exhibit "Bourn-Vita" was described as comprising "malt, milk, eggs and chocolate scientifically combined". "Bourn-Vita" was liberally dispensed to members of the Association visiting the Trade Exhibition and was much appreciated, particularly by the tired officials.

The Pharmaceutical Societies of Australia had an attractive display of pharmaceutical preparations, all made from the formulæ of the "Australian and New Zealand Pharmaceutical Formulary"; also a display of samples of some of the more commonly prescribed formulæ. The object of the display was to show physicians that all "A.P.F." formulæ could be made extemporaneously in any pharmacy throughout Australia. The Australian and New Zealand Pharmaceutical Formulary, which is brought out under the auspices of the British Medical Association and other associations in Australia and New Zealand, has proved to be of great use to many medical practitioners.

Hardy Brothers, Limited, had an attractive display of the art of the goldsmith, silversmith and jeweller. Antiques and *objets d'art* were included.

F. W. Bowker showed a portable short wave therapy apparatus, manufactured by the Waite and Bartlett Corporation of America. The apparatus was claimed to embody the features of an electric cutting machine, a short wave medical diathermy and a surgical coagulation set. A preparation known as "Bariumeal", for use in opaque meal examinations, was also shown; this preparation is flavoured with chocolate.

Chartres Proprietary Limited showed Remington typewriters. Particular attention was drawn to Number 16 (noiseless) and Number 5 (portable) models.

Henry Francis and Company showed a range of animal gland products by Armour and Company, of London; they directed attention to "Glanoid Liver Extract". In conjunction with The Surgical Manufacturing Company (of Australia) Limited, they showed products of Bard Parker and Company, United States of America; of Beiersdorf, London; and of Kahlenberg Laboratories.

W. E. Thorogood showed apparatus as follows: A four-poster bed, a portable table for plaster work, a modified Böhler abduction arm splint, a modified double Thomas's splint for use in poliomyelitis, the "Trumble Walking Splint". A special paste, "Ulyte", for use in substitution of casein was also shown.

Miss Flora Back showed various appliances and surgical supports. These included a support for misplaced kidney, inguinal and umbilical belts, kneecaps, anklets, sacro-iliac corsets and maternity belts.

Stands were also occupied by the Denver Chemical Manufacturing Company, Limited; Elliotts and Australian Drug, Limited; "Viogen" tooth paste.

The Annual Dinner.

The annual dinner in connexion with the Melbourne meeting was held at Myer's Mural Hall on September 12, 1935. The number sitting down at the tables was between 600 and 700. The President, Sir James Barrett, presided, supported by the principal officers of the Association. Among the guests were the Honourable Earle Page, Commonwealth Minister for Trade and Customs, the Honourable R. G. Casey, Commonwealth Treasurer, Councillor A. G. Wales, Lord Mayor of Melbourne, and Dr. J. S. Priestley, Vice-Chancellor of the University of Melbourne.

The Commonwealth of Australia and the City of Melbourne.

Following the toast of "The King", Dr. H. S. Souttar proposed "The Commonwealth of Australia and the City of Melbourne". He said that only those who had travelled out so far could possibly realize the enormous importance of the Commonwealth of Australia and of this City of Melbourne in the great Commonwealth of the British Empire. The things that had struck them most in the very short time that they had been in Australia were the vastness of its spaces, the beauty of its cities, and the overwhelming hospitality by which they had been met everywhere. Everywhere it was a feeling of vastness that they encountered. He found that delegates to the conference had travelled in their own country for a distance of 2,000 miles, and he was told that a mere sheep was expected to have at its disposal at least three acres. Contrast that with the City of London, and still more with the salubrious neighbourhood of Whitechapel, in which his daily work existed! If a sheep was to have three acres, how much was a man to have? An area in London, he should imagine, of about the size of a postage stamp. They were only slowly beginning to realize the enormous importance of the Dominons of the British Empire. The cities of those Dominions might be the jewels in the crown of that Empire, but the Dominions themselves were the roots from which it drew its life. But if they were impressed by the vastness of this Commonwealth, how much more were they impressed by the vastness of the British Commonwealth itself? They should, when they returned home, have travelled the whole way round the globe, and it would be only rarely, if at all, that they should have been out of the reach of the British flag. They had heard lately of wars, and rumours of wars. His firm belief was that the possibility of peace lay in the cohesion of the great British Commonwealth. What was it that held the British Empire together and would hold it together so long as the world existed? Dr. Souttar would tell those present by means of a small symbol. On

Christmas Day they would hear wireless greetings conveyed all over the world from members of the British Empire in various parts of the globe. When the wonder of that was past there would be a pause and they would hear a small kindly voice—a voice of a great English gentleman—coming over the air. Could any of them listen to that voice without a throb in his throat? Dr. Souttar confessed that he could not, and that when that voice came through he did not care to look at anybody else in the room. He thought that that voice embodied the spirit that held the British Empire together. He thought that that man whose voice it was, was himself the embodiment of all that the British Empire admired. The spirit contained in that voice held together the British Empire, and when he himself should pass away that spirit would still maintain its strength. It was because he realized that the Commonwealth of Australia formed such an immensely important portion of the British Empire and that it was full of the spirit which he had mentioned, that he regarded it as such an honour and such a tremendous pleasure to propose the toast.

The Right Honourable Earle Page (Commonwealth Minister for Trade and Commerce) in response said that he wished to thank Dr. Souttar for the manner in which he had proposed the toast of the Commonwealth of Australia, and to reciprocate the sentiments that he uttered with regard to the indissolubility of the British Empire and their desire, although they were a far-flung Dominion from the centre of the Empire, to participate always in the great work for peace that the British Empire was carrying out. He was glad to have the opportunity of responding to this toast because it gave him the chance on behalf of the Government and of the people of Australia to welcome the British Medical Association at its annual meeting to their midst. Australia was always ready to welcome the coming of distinguished scientists to her shores, but she was especially ready to welcome those scientists when they came representing the various parts of the British Empire and as distinguished members of a world-famous organization. Australians regarded the British medical profession as merely the nursery, if it might be called such, of the Australian medical profession. From the British medical profession Australia had drawn the founders of all her medical schools. From that profession Australia drew a great many of her teachers, and would draw more of them, and many of her practitioners. In addition the British Medical Association was welcome because by its wonderful organization during the last century it had raised the standard of medical practice and medical conduct amongst the profession at large. It was not generally realized how much this was in the interests of the public at large—much more than it was in the interests of the medical profession itself, because there was no greater danger to the public health than the unscrupulous unchecked charlatan, whether inside or outside the profession for that matter, and there was no greater asset to the health of the nation than the honour, the integrity, and the high ethical code which the British Medical Association had always striven to enforce and to raise. They also welcomed the British Medical Association because of the wonderful work it had done in so far as preventive medicine was concerned. They had noted with a great deal of pride and admiration the wonderful work being carried out in connexion with preventive medicine by the Medical Research Council in Great Britain and they observed that in the working of that organization the best brains of many laymen had been enlisted and also that, possibly because of that, very heavy endowments had been secured. Dr. Page was hopeful that a permanent memorial of the visit of the Association to Australia would be the inauguration of a Federal Medical Research Endowment Fund in Australia. He trusted that the visit would not merely bring about an added inspiration in the work of the medical profession here, but that the publicity given to it and the high tone and character of the discussions and papers would arouse in the minds of the lay public and of wealthy philanthropists the idea of contributing to such a fund by means of substantial endowments. They might be able in the future by reason of such an endowment fund to see physical research able to be continued on a nation-wide scale, on such a foundation as would make it independent of annual budgets, enabling the best minds to be attracted to it because of the certainty of continuity in their work. Such a fund, if successfully established, would permit the organization of research into the causes and treatment of disease on the widest possible national lines and prevent the spasmodic and chaotic conditions which usually followed the dependence of research upon annual contributions from governments. Some years ago, when he was Federal Treasurer, he had had the opportunity of putting the work of ordinary scientific research in a position to be continued with some regularity. By means of legislation passed then the Federal Treasurer could find in that department of scientific research a recipient for any occasional surplus that he might have and thus help to do work of enduring benefit to mankind. The century of the existence of the British Medical Association had coincided with some of the most remarkable advances that had been made in the art of healing. The standard of the medical profession had been greatly raised and in various ways the medical art had become the finest and noblest and the most humane in the world.

Councillor A. G. Wales (Lord Mayor of Melbourne) responded on behalf of the City of Melbourne.

The British Medical Association.

The Honourable R. G. Casey (Commonwealth Treasurer), in proposing the toast of the British Medical Association, said that Australia in general, and Melbourne in particular, were deeply appreciative of the decision of the Parent Body to allow its one hundred and third annual meeting to be held in Melbourne. They all realized that it was a very rare thing for an annual meeting of the British Medical Association to be held outside the British Isles. As a layman, he did not presume to speak on medical subjects, although he had at various periods in the past been very much exposed to the medical profession, but he should be permitted to say that, as he understood it, the aim and object of the medical profession and of the British Medical Association was the preservation and prolongation of human life. The summit of the achievement of the profession could, he thought, be found in statistics, which showed that in the Australian community the expectation of life had been extended by fifteen years in the last half century. He understood that for women the expectation of life was fairly considerably more than that for men. If the Association and the eminent gentlemen associated with it wished a new field for their endeavour, possibly they might find it in an effort to even the business up. Dr. Souttar had spoken of the great distances that separated Australia from the other parts of the Empire. Mr. Casey was sure that all those visitors who had been good enough to come from overseas to the meeting were very conscious of the enormous spaces that separated Australia from the great centres of population of the world, but this element of physical distance did not stop at that. Within the shores of Australia they also had enormous distances separating the centres of population. Australia was an enormous country, and its capital cities, which, of course, were the main centres of population, were separated from each other by great distances. He believed that this factor of geography in Australia was one that, quite unconsciously, injected itself into Australian social and political and all other lives, in a way that sometimes was not quite realized. He thought that the medical profession, at any rate outside the great capital cities, had been to a certain extent moulded by this factor of enormous geographical distances. He hoped that the visiting members of the Association would realize the attempt that was being made to make them welcome in Australia—an attempt that, of course, found its greatest implementation in the very successful efforts of the local Branch. A gathering such as the present could not fail to have very beneficial results, and he only hoped that the distinguished gentlemen who had come to Australia from overseas would take that as some compensation for all that they must have given up in order to spend so much time in visiting this far-distant land.

Dr. E. Kaye Le Fleming began his reply by announcing that he had received a wireless message from London to this effect:

> British Medical Association throughout the Empire hails Australia on occasion of first annual meeting in Melbourne and sends fraternal greeting to all members gathered there.

That was from Sir Henry Brackenbury, Acting Chairman of the Council in his (Dr. Le Fleming's) absence. If time had permitted, he would have liked to refer to the origin of this great gathering, but he took the opportunity to pay a tribute to Sir Henry Brackenbury for the large share that he had had in persuading the Council that it was right and proper that they should make this great adventure, for they stood that night at the peak of the great adventure on which they had set out from London on July 26 last. He hoped they would all agree with him that that adventure was a successful one. He could not allow the occasion to pass without referring to the great aims and objects that lay behind the Association and its meetings, for which they foregathered from year to year. In the first place, they aimed at pooling all sectional interests of the profession into one great brotherhood. In the second place, they made it a very definite object that no policy that was put forward should ever conflict with the public interest. For that reason alone they were not a trades union. They had behind all their policy an ultimate aim, for it was clear to them, and it was clear to governments, that the health of the public was the most important asset that the State could be concerned with. They must always look forward to the day when they could realize the object that they all had in view, that was that it should be recognized and possible as the right of every citizen of the State to have at his command the best medical services—domiciliary, hospital, institutional, and specialists of every kind—at a cost within his means. It was up to the medical profession to show the way to that goal. Furthermore, it was always their ambition to keep the whole realm of health questions above any party politics. They would always direct their energies in that direction, and they believed that by their wise action they had succeeded in so doing. Everybody must agree that that was for the public good. Lastly, they were out to uphold the great traditions of the profession—the great traditions that had been handed down by their forefathers—and hand them on untarnished to generations of doctors yet to come, for it was idle to shut one's eyes to the fact that there were dangers in the increasing work and cooperation between the State and the medical profession. They were determined, so far as it was possible, to prevent commercialism entering the profession, and every member of the profession, and especially the senior members of it, should use every effort to see that such a result did not come about.

In London they had in the great central hall a wonderfully fine chair, which had been presented to the Association and which it cherished with pride because it was presented by the Commonwealth of Australia. There were engraved on the back of that chair in gold letters words which referred to the tie between Australia and England, and they were these:

> Links light as air,
> Yet strong as iron bands.

Those were the ties that could never be broken. He would end his remarks, as he must end them, on a note of gratitude. The gratification that the wonderful welcome gave to overseas members was greater than he could express. They had expected a welcome, but it was not possible for them to expect such a welcome as they had been given.

Health of the Guests.

Dr. A. L. Kenny proposed the toast of "Our Guests". He said that he was charged in the name of the whole Association to express to them all the warmest greetings, the most hearty welcome, and the best of good wishes from this annual meeting of the Association in the City of Melbourne. The Association was already three years old when John Batman, in 1835, wrote: "This will be the place for a village". In the year of the first centenary celebrations of the State and City, and as the last official celebration of that centenary, they had present the executive of the Association in the persons of the retiring President, the Chairman of the Council, the Chairman of the Representative Body, the Treasurer, the Medical Secretary, and the Financial and Business Manager. Could they be more highly honoured? The special guests, not members of the British Medical Association, were received with open heart and hands and were asked to believe that the welcome to them was deep and sincere. The remarks of the first speaker had suggested at once those lines of the poet:

> What do they know of England
> Who only England know?

Who could give greater evidence of the truth and weight of that saying than those guests who had come from overseas to attend the annual general meeting? The Dominions of Canada, South Africa and New Zealand had sent delegates and representatives who were assured of a welcome in their brothers and sisters' home. Rudyard Kipling, speaking of these dominions with poetical prescience, had anticipated the Statute of Westminster by his lines:

> Daughter am I in my mother's house,
> Mistress in my own.

After welcoming by name Dr. Wu Lien Teh, of China, Dr. Genzo Katoh, of Japan, Professor Bouman, of Amsterdam, and Dr. Guneratnam Cooke, of Ceylon, Dr. Kenny said that there were also others who were welcomed. Hearty greetings were offered to those ladies and gentlemen and to the countries they represented; the greetings carried the hope that the gathering of medical delegates from all around the Pacific Ocean might presage the coming of that time when all of these nations would be bound voluntarily in an impregnable bond of mutual goodwill and friendly development. Perhaps some of the overseas visitors might like a word or two concerning some of the Australian people. There was not very much that Dr. Kenny could tell about the President (Sir James Barrett), although there was much he would like to tell, if time permitted. Perhaps a thumb-nail sketch—he could not give the name of the artist—might convey to the overseas visitors some idea of the type of man they had elected President of the great British Medical Association. It was said that on one occasion a visitor arriving in the City of Melbourne was alarmed to see immense crowds flocking to the streets leading to the Town Hall and proceeding up the steep Collins Street hill, from building line to building line. In his alarm the visitor asked the policeman on point duty: "What on earth has happened; is it civil commotion, a riot, an earthquake or a fire?" The policeman replied: "Do not worry, it is only a slight inadvertence on the part of Dr. Barrett's secretary; he has summoned all the doctors' committee meetings for the same date." Australians in general, and Victorians in particular, were extremely proud of the honour that the Association had conferred upon Sir Edward Mitchell in making him an honorary member of the Association. There were two other names which might not be omitted in that gathering. The Association had seen fit to honour two gentlemen, Dr. R. H. Fetherston and Dr. W. N. Robertson, of Brisbane, by making them Vice-Presidents of the whole Association. In both cases never was honour so well deserved. The occasion should not be allowed to pass without a tribute to the man at the wheel for the whole of this one hundred and third annual meeting, Dr. J. P. Major. Beyond all compare this was absolutely the largest piece of medical organization that had ever been attempted in Australia. There was no question that nothing could have excelled the work that Dr. Major had done in his capacity as Honorary Local General Secretary. In the name of the whole of the British Medical Association Dr. Kenny once more showered welcome on the guests.

Dr. J. E. Priestley (Vice-Chancellor, University of Melbourne), in response, said that he would content himself by saying: "Thank you very much."

The President.

The Right Honourable Lord Horder said that his theme was a personality, and what a personality! At Home, not to know Sir James Barrett argued yourself unknown. He did know Sir James, and therefore he did not suffer from that particular embarrassment, but he had not known many things about him that he knew today. Lord Horder said that as he drew nearer and nearer to Australia his knowledge of Sir James Barrett grew and grew until it was now so encyclopædic that his mind could not choose among the things that he wanted to tell about him. The fact that he was a distinguished ophthalmic surgeon seemed to have been the least of his claims to their respect and admiration. He seemed to have been a pioneer in all the things that one could think of by which the human race might be bettered and improved. Was it public health, was it medical education, was it the provision of playing fields and public parks, of music for the people, the preservation of the flora and fauna of the country? In all these things Sir James seemed to have been the pioneer. Lord Horder was given to understand that the work and activity of which Sir James Barrett was most proud was that of the Bush Nursing system, and he got a thrill out of the knowledge that, although that great work seemed to have been his from the first and his throughout, Sir James Barrett was still only the honorary secretary of that large movement. Lord Horder had always thought that they made a great mistake in regarding the doctor as a man or woman who should stand aside from citizenship. He thought that doctors had all the claims to good citizenship. He proposed the health of a great citizen as well as a great doctor. He wished to congratulate Sir James. Had not the acme of Sir James's aims and ideals come this year when he was Chancellor of a great university and President of the great British Medical Association?

The President said, in response, that he thanked those present from the bottom of his heart, not only for what had been done that night, but for what all the medical men had done so recently. He would take advantage of the opportunity to do something that he had wanted to do for four days, and had been unable to do. He wanted to thank Dr. Major and his assistant, Dr. Downie, for the splendid work they had put in in this organization. He wanted to thank also Dr. Newman Morris and his secretary for the splendid work they put in in organizing the dinner that night. He wanted to thank so many friends—Dr. Zwar, Dr. Hurley and so many other people—who had been active for the last two years in creating this organization and bringing it to a successful issue. Lastly, his wife and he wished, and he was sure all would join with them, to thank Lady Stawell profoundly for continuing that most efficient work of hers as Chairman of the Ladies' Committee.

Medical Appointments Vacant, etc.

For announcements of medical appointments vacant, assistants, *locum tenentes* sought, etc., see "Advertiser", pages xviii, xix. and xx.

Launceston Public Hospital, Launceston, Tasmania: Resident Medical Officer.

St. Margaret's Hospital for Women, Sydney, New South Wales: Resident Medical Officer.

The Western Suburbs Hospital, Sydney, New South Wales: Resident Medical Officers.

Dunolly District Hospital, Dunolly, Victoria: Resident Medical Officer and Superintendent.

Marrickville District Hospital, Marrickville, New South Wales: Honorary Officers.

The Brisbane and South Coast Hospitals Board, Queensland: Honorary Officers.

Medical Appointments: Important Notice.

Medical practitioners are requested not to apply for any appointment referred to in the following table without having first communicated with the Honorary Secretary of the Branch named in the first column, or with the Medical Secretary of the British Medical Association, Tavistock Square, London, W.C.1.

BRANCH.	APPOINTMENTS.
New South Wales: Honorary Secretary, 135, Macquarie Street, Sydney.	Australian Natives' Association. Ashfield and District United Friendly Societies' Dispensary. Balmain United Friendly Societies' Dispensary. Friendly Society Lodges at Casino. Leichhardt and Petersham United Friendly Societies' Dispensary. Manchester Unity Medical and Dispensing Institute, Oxford Street, Sydney. North Sydney Friendly Societies' Dispensary Limited. People's Prudential Assurance Company Limited. Phœnix Mutual Provident Society.
Victorian: Honorary Secretary, Medical Society Hall, East Melbourne.	All Institutes or Medical Dispensaries. Australian Prudential Association, Proprietary, Limited. Mutual National Provident Club. National Provident Association. Hospital or other appointments outside Victoria.
Queensland: Honorary Secretary, B.M.A. Building, Adelaide Street, Brisbane.	Brisbane Associate Friendly Societies' Medical Institute. Chillagoe Hospital. Members accepting LODGE appointment and those desiring to accept appointments to any COUNTRY HOSPITAL, are advised, in their own interests, to submit a copy of their Agreement to the Council before signing.
South Australian: Secretary, 207, North Terrace, Adelaide.	All Lodge appointments in South Australia. All Contract Practice Appointments in South Australia.
Western Australian: Honorary Secretary, 205, Saint George's Terrace, Perth.	All Contract Practice Appointments in Western Australia.
New Zealand (Wellington Division): Honorary Secretary, Wellington.	Friendly Society Lodges, Wellington, New Zealand.

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